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ABSTRACT

In order to produce measurable performance objectives for every vocational education program in the technical and industrial division at a Fresno community college, an educational consultant led a 4-day workshop for 33 community college instructors. Funded under the Vocational Education Act of 1968 in cooperation with the California Community Colleges and the State Department of Education, this report presents performance objectives developed within each instructor's field. Although each of the 33 instructors was required to prepare the satisfactory measurable performance objectives, only 25 completed these assignments. For each general goal, a desired outcome, a performance criterion, a rationale, and conditions required for performing the objectives are provided. For the specific tasks given to meet each goal, rationales, performance objectives, requirements for task performance, and performance criteria are included. The completed objectives are grouped alphabetically by program topics, ranging from agriculture to police science. Follow-up work, including task analyses and in-service training, is being planned. (AG)

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WORKSHOP IN THE PREPARATION OF MEASURABLE PERFORMANCE OBJECTIVES

Fresno City College

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FRESNO CITY COLLEGE
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INTRODUCTION

1. Purpose of the workshop

a. The initial impetus for the workshop came from the State Department of Education, and the California Community Colleges. If program budgeting (accountability) is to function efficiently, classroom instruction must be keyed to Measurable Performance Objectives.

b. As originally planned, the purpose of the workshop was to produce measurable performance objectives for every education program in the Techincal Industrial Division at Fresno City College.

2. Participants

It became apparent that this was too large a task to accomplish within the time limits of the workshop, and the following was adopted:

> Mr. Blaine Wishheart, consultant with the Education Research Agency, acted as workshop leader. Thirty-three (33) instructors from West Hills, Reedley, and Fresno Community Colleges participated and each was required to prepare ten (10) satisfactory measurable performance objectives within his instructional field. Twenty-five (25) completed the practice assignments listed under II, below.

3. Procedures

Workshop meetings were held in room T-400 at Fresno City College from 8:00 am to 3:00 pm on four (4) Saturdays, March 13, March 27, April 17, and May 1. Additional small group meetings were scheduled between April 17 and May 15 to prepare the material for typing.

Program of Instruction (Outline)

1. Management framework.
2. Purposes of developing Measurable Performance Objectives (M.P.O's)
3. Definition of M.P.O.
4. Relationship of M.P.O's to instructional goals and program budgeting.
5. Types of M.P.O's.
6. Hierarchies of Measurable Instruction Performance Objectives.
7. Samples of M.P.O's.
8. Writing ten (10) acceptable M.P.O's.
9. Evaluating M.P.O's.
10. Methods of developing M.P.O's.

During the course of the workshop, as each participant completed an M.P.O., it was judged by ten other participants and by the workshop leader. The criteria used for judging acceptability were:

1. The Outcome Component: To what degree does the statement *define the desired outcome?*
2. The Criterion Cpmponent: To what degree does the statement *define the standard of measuring success?*
3. The Requirement Component: To what degree does the statement define the *conditions* under which the activity is to be performed?
4. The Rationale Component: To what degree does the statement communicate the *rationale* for the objective?

Each M.P.O. was judged in terms of these four (4) components on a rating scale from zero to 100. To be acceptable, every component of an M.P.O. must recieve a rating of 50 or above.

4. Evaluation of Results

An analysis of the completed M.P.O.'s developed in the workshop indicates that an attempt was made to do too much in too short time. A great deal of groundwork must be laid at all levels if the requirements of program budgeting and "accountability" are to be met. One of the major outcomes of this workshop has been recognition of the enormity of the task.

5. Follow-Up

Among other follow-up activities is the preparation of this report. Copies will be sent to the office of the State Assistant Chancellor of Vocational Education. Plans are being made to use the knowledge and skills obtained by the workshop participants to assist others in the use of the DELPHI panel techniques and for developing M.P.O.'s. At Fresno City College the DELPHI panel discussion techniques have been applied as a tool to determine the Technical and Industrial Division objectives for the 1971-1972 school year. Three examples of this procedure are presented below, and illustrate the background work that must be done before true performance objectives can be developed.

During the 1971-1972 school year, faculty members will have additional training and practice in applying the DELPHI panel technique. A complete task analysis, with measurable performance objectives, will be performed on one vocational program. If this is successful, these techniques will be applied to all of the Technical and Industrial programs.

TECHNICAL AND INDUSTRIAL DIVISION

PERFORMANCE OBJECTIVE NO.1

OUTCOME: The Fresno City College Technical-Industrial Division shall impart necessary knowledge enabling a student to enter an occupation.

CRITERION: This objective of the Division shall be considered satisfied when graduating students can successfully pass a standardized knowledge examination necessary for entry into thier major field.

REQUIREMENTS: Under standardized testing conditions and given as part of the course of instruction.

RATIONALE: This objective assures the student of his competency in the knowledge of this chosen trade.

FOOTNOTE 1. It is noted here that employment in the chosen trade is not the criterion by which success of the division shall be judged. Too many variables beyond the control of this institution enter into and affect the employment of any given student. Consequently, success of the division shall be judged on the acquisition of the necessary skills on the part of the student while he is in attendance here.

FOOTNOTE 2. It is noted here that the necessary standardized examination instrument required by this performance objective does not, in most cases, now exist. In some cases (such as the Registered Nurse program, and in one respect, the Federal Communications Commision's examinations) an instrument (or at least a semblance of one) that would serve this purpose does exist. In the majority of cases, however, no such examination or test instrument has yet been developed or at least perfected to the point of nation-wide acceptance (indeed, it would have to be accepted nation-wide and developed in co-operation with all involved trade areas). This means that an honest evaluation of this performance objective cannot be made at this time and will have to await the development of standardized examinations to suit these purposes.

TECHNICAL AND INDUSTRIAL DIVISION

PERFORMANCE OBJECTIVE NO.2

OUTCOME: The Fresno City College Technical-Industrial Division shall impart the necessary manual dexterities and physical skills enabling a student to enter an occupation.

CRITERION: This objective of the division shall be considered satisfied when graduating students can successfully pass a standardized manipulative examination necessary for entry into thier major field.

REQUIREMENTS: Under standardized testing conditions and given as part of the course of instruction.

RATIONALE: This objective assures the student of his physical ability to perform in his chosen trade.

FOOTNOTE 1. Again, the necessary test instrument–the standardized manipulative examinations–is not now available and would have to be developed before this performance objective could be applied.

TASK:	**Calibrating A Sprayer**
CRITERION:	Ability will be measured in four areas: 1. computation of calibration plots, 2. determination of ground speeds, 3. adjustment of pressure settings, and 4. determination of sprayer output.
REQUIREMENTS:	The student will work five practical calibrating problems on paper correctly and will then calibrate a sprayer to within an error of two gallons per acre, within a sixty minute period.
RATIONALE:	An agronomist must be able to accurately calibrate spray equipment to avoid injury to the crop while killing the weeds and harmful insects.
OUTCOME:	The student should be able to calibrate a sprayer for application of herbicides and insecticides to within an error of two gallons per acre.

TASK:	**Weed Identification**
CRITERION:	Given a picture, pressed plant mount, or a fresh specimen, the student will be able to call it by its proper common name and relate its classification by life span and morphological features. The student will pass the written tests by a score higher than 85% and will make a weed infestation record of two fields of his choice.
REQUIREMENTS:	The weeds will be studied on a weekly basis over a sixteen week period.
RATIONALE:	An agronomist must be able to recognize the major weed species in a field in order to make a proper choice of herbicides to control them.
OUTCOME:	The student will be able to identify and write the common names of sixty weed species.

TASK: **Herbicide Selection**

CRITERION: The student will be judged successful when he can list the desirable herbicides for five different crop situations as given him by the instructor within a four day period. He also must pass the written examination relating to herbicide characteristics.

REQUIREMENTS: Given a list of weeds in a given crop or crop rotation, the student will select a desirable herbicide (in the opinion of the instructor) to control the weeds without injury to the crop. He may use two references of his choice.

RATIONALE: An agronomist must make wise choices in herbicides for proper weed control without injury to the crop.

OUTCOME: The student will be able to select the proper herbicide for a particular weed problem.

TASK: **Herbicide Application**

CRITERION: When the student passes the written examination at the 90%level he will demonstrate to the instructor that he can check a sprayer for readiness and drive it in application properly within a thirty minute period.

REQUIREMENTS: The student will work five practical problems on paper correctly. They will test his knowledge in sprayer calibration and rate calculation.

RATIONALE: An agronomist must be able to apply herbicides at proper rates and in a proper manner to kill weeds without injury to the crops.

OUTCOME: Given a sprayer and a herbicide, the student will be able to apply the herbicide at the proper rate and check the sprayer for proper application.

TASK: **Nitrogen Management in Sugar Beets**

CRITERION: The student will be judged successful when he can calculate the amount of side dress nitrogen needed to grow a crop in three situations as given by the instructor within a forty minute period.

REQUIREMENTS: Given three situations, identify the proper techniques.

RATIONALE: A sugar beet grower must manage his nitrogen fertilizer in a scientific manner in order to produce optimum returns.

OUTCOME: The student will be able to outline the sequence of procedures for using the nitrogen strip technique in sugar beets.

TASK: **Selection Of Commercial Fertilizer Materials**

CRITERION: Without the aid of reference, the student will pass a written test above 80% as a measure of his understanding, which will cover two weeks of course time.

REQUIREMENTS: Differentiate between several kinds and sources of fertilizers and identify the chemistry of each. Solve problems on paper of computation of amounts, price per unit, and other practical problems.

RATIONALE: An agronomist computes fertilizer rates in order to buy proper amounts of fertilizer. He needs to know what to use and when to apply and what materials are the best buy to produce the best crops.

OUTCOME: The student will be able to work practical problems and make sound decisions in fertilizer practices as related to growing crops.

TASK: **Reclamation And Management Of Alkali And Saline Soils**

CRITERION: The student will pass a written examination with a maximum score of 80% and will complete satisfactorily lab exercise number twelve within a two-hour period.

REQUIREMENTS: Pass a written examination and demonstrate the effect of sodium in the soil by completing lab exercise number twelve.

RATIONALE: An agronomist may need to know the principles of soil reclamation to recover or improve a soil's production for better crop growth and returns.

OUTCOME: The student will be able to differentiate between a saline and an alkali soil condition, write procedures for reclaiming such soil, and list tolerant crops that could be grown.

TASK: **Set-Up And Calibration Of Row Crop Planters**

CRITERION: The student's calibration information will be recorded and evaluated. The team will have ninety minutes to complete the task correctly.

REQUIREMENTS: The student will follow the task detailing sheet with a team of five other students and when he has completed the set up and calibration, it will be checked by the instructor.

RATIONALE: An agronomist must be proficient in planter calibration in order to get good emergence, plant population, and to save seed. Seeding rates also influence costs of later manual work.

OUTCOME: The student will be able to set up four row crop planters on a planting sled and calibrate them to a pre-determined seeding rate.

TASK: **Calibration Of A Fertilizer Applicator**

CRITERION: The calibration must be accomplished within a sixty minute period with an allowable error of 15% per acre.

REQUIREMENTS: The student will work five practical calibrating problems on paper correctly and then calibrate and adjust an applicator to deliver a certain rate of fertilizer.

RATIONALE: An agronomist must be able to accurately calibrate a fertilizer applicator in order to apply the proper rates and kinds of fertilizer which influences crop production and quality.

OUTCOME: The student will be able to adjust and calibrate a fertilizer applicator to a pre-determined rate.

TASK: **Identify Plant Nutritional Needs**

CRITERION: Student knowledge will be measured in a written examination which he must pass above 80% in a thirty minute period.

REQUIREMENTS: The student will identify hunger symptoms in a selected group of plants.

RATIONALE: An agronomist must be able to identify hunger signs in crops in order to avoid and correct fertilizer deficiencies.

OUTCOME: The student will be able to recite the sixteen essential elements and their function in the plant, differentiate as to their mobility or immobility, and relate this information to the deficiency symptoms in a plant.

TASK: **Estimate Of Production Of Standing Barley**

CRITERION: The student is successful if his estimate varies from the actual production by not more than 5%.

REQUIREMENTS:

1. Select at least three different fields having obvious different production levels.
2. Estimate the yield per acre from visual observation.
3. Collect 10 representative samples from each field.
4. Separate the grain, weigh it and establish the per acre yield for each field.
5. After harvest, compare your visual, and sample production estimates with the actual harvest production level.
6. The sample should fall within 5% of the actual.

RATIONALE: An agronomist must be able to estimate production by visual observation. The actual sampling is generally used only as a means of training the visual accuracy.

OUTCOME: The student will be able to estimate the production per acre for a field of standing barley.

TASK: **Establish A Corn Variety Test Plot**

CRITERION: The student is successful if his final report is an accurate summary of the data collected.

REQUIREMENTS:

1. Test a minimum of 5 different varieties.
2. Provide for 2 replications of each variety in different parts of the field.
3. Record all significant cultural practices, use same for all varieties.
4. Make notation of noticeable differences in the varieties as they appear.
5. Using standard sampling procedures, pick all the corn from the representative area. Weight the corn accurately, and make comparisons.
6. Make all other observations which may have bearing on the success of a variety.
7. Condense all data on a one page report.

RATIONALE: An agronomist must be able to establish and maintain test plots in such a manner as to produce accurate data for the selection of varieties for his farm.

OUTCOME: The student will be able to establish and maintain a satisfactory test plot.

TASK: **To Understand The Development Of the Cotton Plant And Its Root Structure**

CRITERION: The student is successful if his experimental results correspond with scientifically determined data.

REQUIREMENTS:

1. Plants should be dug up several times during growing season to provide the grower with knowledge of the various stages of growth. He should illustrate and describe each important stage of growth and maturity.
2. Plants should be dug at the following stages: (minimum)
   a. 1 day prior to emergence
   b. 10 days after emergence
   c. when 4 true leaves have developed
   d. when squares start to form
   e. when bowls are formed
   f. when bowls have opened
3. Plants should also be dug in various field, where the tillage practices vary to make comparisons of both the root and plant development.

RATIONALE: The agronomist must be familiar with each stage in the growth of the cotton plant, and the probable time lapse between each stage.

OUTCOME: The student will be able to apply the proper techniques in the study of cotton plant growth.

TASK: **To Operate A Grain Combine**

CRITERION: Student performance must compare favorably with that of skilled workers.

REQUIREMENTS:

1. Harvest grain from 5 acres, using a self propelled combine.
2. All standing grain must be cut.
3. The combine must be adjusted and operated in a manner to permit no more than 2% to pass through the straw. Test sample to be collected.
4. The combined grain should be clean and free of straw and chaff.
5. No more than 5% of the kernels should be cracked.
6. The grain must be augered into the storage bin, without spilling any.

RATIONALE: The agronomist must be able to accurately adjust and operate grain combines, since they are vital implements in the harvesting of field crops. He must be also able to effectively train helpers.

OUTCOME: The student will be able to operate a grain combine in a satisfactory manner.

TASK: **To Operate A Land Plane**

CRITERION: The blade must be adjusted to provide a minimum of 6 inches of dirt in front of it at all times. There shall be no humps or piles of loose dirt that are over 2 inches high.

REQUIREMENTS:

1. Must hitch unit to tractor properly, as described in work plans.
2. Blade must always have enough dirt in front of it to fill the low spots.
3. Field must be covered by first traveling crossways to the slope of the field, and secondly in the same direction as the rows will be run.
4. Turns must be made in such a manner as to not leave any piles of dirt, or any untouched spots.
5. All rough spots caused by turning must be eliminated by driving crossways across the ends.
6. Five check points must be marked off 100 feet apart in a line parallel to the way the rows will run. A check with a transite should show these points not being off grade more than one tenth of a foot.

RATIONALE: The agronomist must be able to prepare land for planting and make it sufficiently level for water to run smoothly, without ponding any place.

OUTCOME: The student will be able to remove all high and low spots in a given block of land.

TASK: **To OPerate A Corn Planter**

CRITERION: Rows must be straight and properly planted with no more than 5% error seed placement or row misalignment.

REQUIREMENTS:

1. Rows must be straight
2. Correct spacing of rows between sets, within 3 inches
3. Seeds spaced 5 inches apart (allow ½ inch variation)
4. Seeds placed in moist soil, and firmly covered
5. No more than 1 seed in 20 damaged.
6. The points above to be checked in 10 different locations of the planted area. Twenty four (24) inches of row uncovered at each check point.

RATIONALE: The agronomist must be able to accurately set, adjust, and operate corn planters, in order to successfully farm field crops. He must also be able to train his workmen.

OUTCOME: The student will be able to plant rows of corn in a satisfactory manner.

TASK: **To Operate A Corn Cultivator**

CRITERION: All weeds must be removed, with no more than 1 corn plant in 30 disturbed.

REQUIREMENTS:

1. Hitch and assemble cultivator according to plan.
2. Make necessary field adjustments.
3. Cultivate 24 rows.
4. All weeds must be removed, except for a 4 inch band near the corn plants.
5. Corn plants must not be disturbed:
   a. no more than 3% of plants
   b. no more than 5 plants in any one spot in a row.

RATIONALE: The agronomist must be able to set up and operate cultivators in order to successfully farm field crops.

OUTCOME: The student will be able to cultivate rows of corn in a satisfactory manner.

TASK: **Moisture Analysis Of Harvested Grain**

CRITERION:

1. Results should not vary more than two (2) percentage points.
2. Make comment on variations
3. Make observations of any damage or heating of the stored grain, caused from too much moisture.

REQUIREMENTS:

1. Select minimum of 10 samples, some directly from harvester, and some from storage.
2. Test each sample, using the moisture meter.
3. Test each sample, by means of accurate weights before and after oven drying of the samples.
4. Compare the sampling results from the two methods.

RATIONALE: The agronomist must be able to accurately test all types of grain and forages for moisture content. He must also be able to identify spoilage due to excessive moisture.

OUTCOME: The student will be able to apply the proper techniques in the moisture analysis of harvested grain.

TASK: **Determination Of Bushel Weights Of Harvested Grain**

CRITERION: The student is successful if his use of the sample scale results in accuracy to within 1%.

REQUIREMENTS:
1. Select samples of grain from 10 different fields.
2. Weigh one bushel from each sample.
3. Use the test scales, weighing only the required amount from each sample.
4. Report the apparent accuracy of the sampling scale in each check.
5. Repeat procedure throughout season on different types of grain.
6. Accuracy in the use of the sample scale must be within 1%.

RATIONALE: The agronomist must be able to accurately determine the per bushel weight of the harvested grain, since sale price structure is usually predicated on this measure of quality.

OUTCOME: The student will be able to apply a sampling procedure to the estimation of bushel weights of harvested grain.

TASK: **Adjustment And Operation Of Hay Mowing Machine**

CRITERION: The student must hitch the mower to a tractor. He must be able to go into a field and make initial cut, make necessary adjustments and complete the cutting of 5 acres of hay. All of the plants must be cut with minimum overlap.

REQUIREMENTS:
1. Hitching procedure to be in accordance with operators manual.
2. No uncut plants allowed after initial cut, except in areas where plants are lodged.
3. Needed adjustments should be explained to checker, or recorded in report.
4. If more than two needed adjustments are observed by checker, that are not corrected by operator, will constitute unsatisfactory work.

RATIONALE: The agronomist must be able to use various type of mowing machines as regular routine of producing forage crops. He must be able to train others to operate them effectively also.

OUTCOME: The student will be able to adjust and operate a hay mowing machine.

TASK: **To Produce A Legal Description (Meets and Bounds)**

CRITERION: The training will be judged successful when each student has written one (1) satisfactory legal description in conformance with the information given him by the instructor.

REQUIREMENTS:

1. All wording in the legal description shall be clear and concise.
2. The boundaries of the property shall have an error of closure of less than one one-thousandth.
3. The legal description shall be completed within three two-hour class periods using pencil on 8½ x 11 inch 1000H paper.
4. Upon completion the student should be able to prepare a legal description by meets and bounds under the supervision of a civil engineer.

RATIONALE: Engineers and architects require that their draftsmen be able to prepare legal descriptions.

OUTCOME: The student will be able to prepare a legal description using meets and bounds.

TASK: **To Produce A Tentative Subdivision Map**

CRITERION: The training will be judged successful when each student has drawn one (1) satisfactory tentative subdivision map on 1000H paper in conformance with the information given him by the instructor.

REQUIREMENTS:

1. All lettering on the tentative map is legible and the line work is clear.
2. The map shall be completed within five two-hour class periods using standard drafting equipment, pencil, 1000H paper, and the classroom drafting table with drafting machine.
3. All lines and distances shall be within two feet at a scale of one inch equals one-hundred feet.
4. Upon completion, the student should be able to prepare a tentative subdivision map for an engineering firm under the supervision of a civil engineer.

RATIONALE: The preparation of tentative subdivision maps is a typical task assigned to engineering draftsmen.

OUTCOME: The student will be able to prepare a tentative subdivision map delineating proposed property divisions for approval by the County Planning Department.

TASK: **To Produce A Final Subdivision Map**

CRITERION: The training will be judged successful when each student has drawn one (1) satisfactory final map on linen in conformance with the information given him by the instructor.

REQUIREMENTS:

1. All lettering on the map is legible and the line work is clear.
2. All traverses within the map have an error of closure of not more than one one-thousandth.
3. The map shall be completed within four two-hour class periods using an inking set, linen, and the classroom draft-table with drafting machine.
4. Upon completion the student should be able to prepare a final map for an engineering firm under the supervision of a civil engineer.

RATIONALE: Preparation of subdivision maps is part of the training of engineering draftsmen.

OUTCOME: The student will be able to prepare a final subdivision map, properly delineating the divisions within the site.

TASK: **To Produce A Record Of Survey**

CRITERION: The training will be judged successful when each student has drawn one (1) satisfactory record of survey on linen in conformance with the information given him by the instructor.

REQUIREMENTS:

1. All lettering on the map is legible and the line work is clear.
2. All traverses within the record of survey have an error of closure of not more than one ten-thousandth.
3. The record of survey shall be completed within four two-hour class periods using an inking set, linen, and the classroom drafting table with drafting machine.
4. Upon completion the student should be able to prepare a record of survey for an engineering firm under the supervision of a civil engineer.

RATIONALE: The well trained engineering draftsman is able to prepare records of survey.

OUTCOME: The student will be able to prepare a record of survey accurately delineating property locations.

TASK: **To Produce A Street Plan And Profile Sheet**

CRITERION: The training will be judged successful when each student has drawn one (1) satisfactory street plan and profile sheet on linen in conformance with the information given him by the instructor.

REQUIREMENTS:

1. All lettering on the plan and profile is legible and the line work is clear.
2. The information from the furnished field notes shall be plotted within two feet at a scale of one inch equals fifty inches.
3. The street plan and profile shall be completed within ten two-hour class periods using an inking set, linen, and the classroom drafting table with the drafting machine.
4. Upon completion, the student should be able to prepare a street plan and profile sheet for an engineering firm under the supervision of a civil engineer.

RATIONALE: The preparation of street plans and profile sheets may be among the assigned tasks of the engineering draftsman.

OUTCOME: The student will be able to prepare a street plan and profile sheet suitable for use in the construction of a street.

TASK: **To Produce A Topo Map**

CRITERION: The training will be judged successful when each student has drawn one (1) satisfactory topo map on 1000H paper in conformance with the information given him by the instructor.

REQUIREMENTS:

1. All lettering on the map is legible and the line work is clear.
2. The contour lines are within two feet at a scale of one inch equals fifty feet of the master map for the assignment.
3. The topo map shall be completed within three two-hour class periods using pencil on 1000H drafting paper, and classroom ten-point dividers, drafting table, and drafting machine.
4. Upon completion the student should be able to prepare a topo map for an engineering firm under the supervision of a civil engineer.

RATIONALE: The ability to prepare satisfactory topological maps may be a criterion for job placement.

OUTCOME: The student will be able to prepare a topo map which would delineate the land surface conditions for the use of architects and/or engineers.

TASK: **To Produce A Plan For A Water Distribution System**

CRITERION: The training will be judged successful when each student has drawn, in pencil, one (1) satisfactory play for a water distribution system on 1000H drafting paper in conformance with the information given him by his instructor.

REQUIREMENTS:

1. All lettering on the plan is legible and the line work is clear.
2. The information from the furnished data shall be plotted within three feet at a scale of one inch equals one-hundred feet.
3. The plan shall be completed within five two-hour class periods using pencil, 1000H paper, scales, drafting table, and drafting machine.
4. Upon completion the student should be able to prepare a plan for water distribution system under the supervision of a civil engineer.

RATIONALE: Water distribution systems are an integral part of many construction projects.

OUTCOME: The student will be able to prepare in sufficient detail, a plan for a water distribution system to be used in the construction of the water system.

TASK: **To Produce A Mass-Diagram**

CRITERION: The training will be judged successful when each student has calculated and drawn a satisfactory mass-diagram on cross-section paper and linen in conformance with the information given him by the instructor.

REQUIREMENTS:

1. All lettering on the mass-diagram is legible and the line work is clear.
2. The calculations are correct within 10% of the master calculations.
3. The mass-diagram shall be completed within four two-hour class periods using pencil on cross-section paper for calculations and ink on linen for the diagram. A drafting table with drafting machine is furnished.
4. Upon completion the student should be able to prepare a mass-diagram for an engineering firm under the supervision of a civil engineer.

RATIONALE: Junior engineers and technicians are frequently assigned the task of preparing mass-diagrams.

OUTCOME: The student will be able to prepare a mass-diagram suitable for use in the construction of roadway bed.

TASK: **To Produce A Legal Description (Sectional)**

CRITERION: The training will be judged successful when each student has written one (1) satisfactory legal description in conformance with the information given him by the instructor.

REQUIREMENTS:

1. All wording in the legal description shall be clear and concise.
2. The property involved shall be completely described with no possible misunderstanding of location.
3. The legal description shall be completed within three two-hour class periods using pencil on 8½ x 11 - 1000H paper.
4. Upon completion the student should be able to prepare a legal description by sectional divisions under the supervision of an engineer.

RATIONALE: If the student is to be considered employable by an engineering firm, he must be able to locate property accurately.

OUTCOME: The student will be able to prepare a Legal Description using township, range, and section divisions.

TASK: **To Prepare A Technical Report**

CRITERION: The training will be judged successful when each student has completed a satisfactory technical report on a selected subject in his major area.

REQUIREMENTS:

1. All figures and tables must be clearly prepared; all words shall be spelled correctly; all sentences shall be in proper form.
2. The report shall contain a letter of transmittal, index, introduction, analysis, conclusion, and bibliography.
3. The technical report shall be completed and typed within nine one-hour class periods.

RATIONALE: The ability to communicate instructions, ideas, and evaluations in writing is basic.

OUTCOME: The student will be able to communicate technical information in writing understandable to both the technician and to the layman.

TASK:	**Preparation Of A Site Plan**
CRITERION:	The student's work will be judged using the standards called for by F.H.A., the Uniform Building Code, and the local city and county codes.
REQUIREMENTS:	The site plan shall be drawn to an accurate scale, using the standards set forth by F.H.A., U.B.C., city and county codes. and with the use of notes and other graphic means, indicate all of the information that is required by the above listed codes. This shall be done in ink and in the time of not more than six hours.
RATIONALE:	One of the first parts of a complete set of drawings used in construction of a building is the site plan. This plan is the basis for locating the building on the site.
OUTCOME:	The student will be able to take diagrammatic sketches of a site plan and transform it into working drawings to be used in the construction of a building.

TASK:	**Preparation Of A Foundation Plan**
CRITERION:	The student's work will be judged on his compliance with engineering calculations, F.H.A., Uniform Building Code, city and county codes.
REQUIREMENTS:	The foundation plan and foundation details shall be drawn accurately and to scale, using notes and dimensions to convey all of the information and requirements found or indicated in the engineering calculations, F.H.A., U.B.C., city and county codes. This shall be done in not more than eight hours using ink.
RATIONALE:	The foundation of a building must be correct, as it acts as the basis or base for all of the building components. The ability to read the requirements from a set of calculations or codes helps set the foundation correctly.
OUTCOME:	The student will be able to take either a preliminary sketch or an accurately drawn floor plan and prepare a foundation plan and details.

TASK: **Preparation Of A Floor Plan**

CRITERION: The student will be judged on his use of the standards as set forth by F.H.A., Uniform Building Code, city and county codes and the information found on the preliminary plan.

REQUIREMENTS: The student is expected to accurately draw the floor plan of a building to scale, indicating or calling out all of the information found on the preliminary plan, and to expand this information to include the requirements of F.H.A., U.B.C., city and county codes. This shall be drawn in pencil and in a 16-hour time limit.

RATIONALE: The floor plan is the key drawing in any set of construction or working drawings. From this "master" drawing many other drawings are made and used to complete the set. The draftsman who can draw this plan accurately and quickly will always have a job.

OUTCOME: The student will be able to take a preliminary floor plan and transfer the information given into a complete floor plan to be used in the construction of a building.

TASK: **Preparation Of Floor Or Roof Framing Plan**

CRITERION: The student will be graded on his ability to apply the information found on the engineering calculations and correlate with the requirements of F.H.A., U.B.C., city and county codes.

REQUIREMENTS: The floor or roof framing plan and details shall be drawn accurately and to scale, with all of the requirements found or indicated on the engineering calculations, F.H.A., U.B.C., city and county codes making sure that all of the parts of the structure fit together properly. This shall be done in ink and in not more than 12 hours.

RATIONALE: The framing plans and details are used in putting the building pieces together. The draftsman must have the ability to take the calculations and draw the pieces in their proper order.

OUTCOME: The student should be able to take a completed floor plan and draw the floor framing or roof framing plan and related details for the building.

TASK: **Preparation Of Roof Plan**

CRITERION: The student will be graded on his ability to use various roofing manufacturers standards for the numerous roofing materials and correctly use the proper roofing material where recommended.

REQUIREMENTS: The roof plan shall be drawn accurately and to scale for the following types of roofs: hip, gable, flat, mansard, dutch hip, and shed using wood shakes, composition roofing, asphalt shingles, and copper with the correct roof type as the standards call for as called for by the various roofing manufacturers recommendations in not more than ten hours.

RATIONALE: The ability to place or draw any type of roof on a building with any type of roofing material, and to do so correctly, is one of the prime functions of the architectural draftsman.

OUTCOME: The student should be able to take a floor plan and apply any desired type of roof or roofing material to the building.

TASK: **Preparation Of A Perspective Drawing**

CRITERION: The student will be graded on his ability to use two point or office method of perspective, using the correct shade and shadows.

REQUIREMENTS: The perspective shall be drawn accurately, to scale, using the two point or office method, on a piece of illustration board 20" x 30" in size, in ink, with no corrections made in the line work. All trees, bushes, people, cars, and the correct shade and shadows drawn in a neat and pleasing manner. This shall be done in not more than 15 hours.

RATIONALE: Many times the draftsman is called upon to prepare such drawings so that the client is better able to see the building or the drawing is used for promotional work.

OUTCOME: The student should be able to take a preliminary sketch of a building and draw a rendering or perspective of it in ink.

TASK: **Preparation Of Detail Drawings To Scale**

CRITERION: The student will be graded on his ability to use the standards for structural detailing as called for by the American Institute of Steel Construction.

REQUIREMENTS: The details will be drawn accurately and to scale, using A.I.S.C. standards and any engineering calculations that might be available, with no errors in drawing and completed in not more than three hours.

RATIONALE: The ability to take pre-engineered sketches and draw complete details is an essential part of the training of a structural draftsman.

OUTCOME: The student should be able to take diagrammatic sketches and draw accurate scale drawings from them.

TASK: **Preparation Of Cabinet Cross Sections**

CRITERION: The student will be graded on his ability to use standards as set forth by the Woodwork Institute of California.

REQUIREMENTS: The cross section and details of the cabinet shall be drawn accurately and to scale, as called for by the W.I.C. standards, indicating which options, as allowed by W.I.C., shall be used. This drawing shall be completed in not more than eight hours time using ink.

RATIONALE: The architectural draftsman has to be able to draw correctly the cabinet details and section so as to convey to the cabinetmaker the quality and standard that the mill should use in order to make the cabinets as desired.

OUTCOME: The student should be able to take interior elevations of a cabinet and draw a cross section thru the cabinet and to draw the related details.

TASK:	**Application Of Newton's Second Law**
CRITERION:	The student will be graded on his ability to use Newton's Second Law: F = MA.
REQUIREMENTS:	Given five problems involving any combination of two parts of the equation for Newton's Second Law, solve for the unknown part, using the correct units of measurements, and do so in not more than thirty minutes at slide rule accuracy.
RATIONALE:	The ability to recognize the relationship of force, mass, and acceleration is primary to understanding the basic workings of simple machines.
OUTCOME:	The student should be able to read a problem, interpret the information and apply Newton's Second Law, solving for the unknown quantity.

TASK:	**Beam Calculations**
CRITERION:	The student will be graded on his ability to use the requirements of the Uniform Building Code in solving beam problems.
REQUIREMENTS:	Given three wood beams, each of a different species of wood, and each with a different type of loading and span, calculate the correct size as required by the procedure listed in the U.B.C. using slide rule accuracy in the time of not more than thirty minutes.
RATIONALE:	Many times the architectural draftsman needs to be able to find sizes for beams, in order to complete his drawings. The ability to do so is of prime importance to his job and to assure his advancement.
OUTCOME:	The student should be able to calculate the size of simple wood beams.

TASK: **The Ability To Test A Battery**

CRITERION: Student performance shall be judged acceptable when test procedures are followed as outlined by instructor. All Tests must be made within a specified time period set by the instructor.

REQUIREMENTS: Testing shall be performed with proper equipment for testing both capacity and specific gravity. Readings must be within manufacturers specifications.

RATIONALE: The job of battery testing must be performed accurately by a mechanic if he is to determine if battery is usable.

OUTCOME: The student shall be able, when given a battery, to test and determine if the battery is usable.

TASK: **The Ability To Replace Cam Bearings**

CRITERION: Cam bearing replacement shall be acceptable when student can remove and replace identified faulty cam bearings as outlined in manufacturers service manual. Bearing replacement must be completed within time period specified by instructor.

REQUIREMENTS:
1. Visual inspection of bearing
2. Bearing replacement must be made using proper bearing installation equipment.

RATIONALE: The job of cam bearing replacement must be accurately performed to maintain proper engine performance and reliability.

OUTCOME: The student will be able to inspect cam bearings to determine if bearings are usable or if replacement is necessary.

TASK: **The Ability To Recondition A Cylinder**

CRITERION: A reconditioned cylinder will be judged acceptable for service when reconditioning procedures are followed as outlined by instructor or manufacturer. Reconditioning must be performed within a specified time set by instructor.

REQUIREMENTS:
1. Cylinder must be checked with proper measuring instrument. If cylinder is within specification it is serviceable.
2. If cylinder is not within specification it must be resized using a special cylinder resizing tool.

RATIONALE: Cylinder reconditioning must be performed with absolute accuracy. Maximum engine performance depends on properly conditioned cylinders.

OUTCOME: The student will be able to recondition a cylinder.

TASK: **The Ability To Recondition A Valve**

CRITERION: A reconditioned valve will be judged acceptable for service when the valve meets specifications set by the instructor or the manufacturer. Work must be performed within a specified time limit.

REQUIREMENTS:
1. Valve refacing must be performed with a precision valve grinding machine.
2. Valve stems must also be resurfaced with valve grinder.

RATIONALE: Proper valve seat contact is probably one of the most important factors in maximum engine performance. Valve reconditioning is performed frequently and must be done precisely.

OUTCOME: The student will be able to recondition a valve.

TASK: **The Ability To Repair Standard Transmission**

CRITERION: Transmission shall be acceptable for service when it operates in a satisfactory manner and when overhaul procedures as outlined in transmission repair manual have been followed and completed in a specified time limit as set by instructor.

REQUIREMENTS: 1. Transmission must be disassembled, components inspected for wear, worn or damaged parts replaced, and transmission reassembled.

RATIONALE: Proper transmission operation is essential if vehicle is to be a reliable and efficient means of transportation. Therefore, the ability of a mechanic to repair a transmission accurately is vital.

OUTCOME: Student will be able to diagnose and make necessary repairs to restore transmission to proper operating condition.

TASK: **The Ability To Overhaul Manual Steering Gear**

CRITERION: A steering gear will be acceptable for service when overhaul procedures and adjustments have been performed as outlined in manufacturers repair manual or by instructor. Service must be performed within a specified time limit set by instructor.

REQUIREMENTS: Steering gear unit must be inspected, components checked for damage or wear, defective components replaced, and gear unit adjusted to specifications.

RATIONALE: The steering gear unit in the modern automobile is a precision piece of equipment. The directional stability of a vehicle is dependent on the precise operation of an accurately serviced and adjusted steering gear unit.

OUTCOME: The student will be able to diagnose and correct steering gear problems.

TASK: **The Ability To Replace Brake Linings**

CRITERION: Relined brakes will be acceptable for service when procedures for replacing brake linings have been followed as outlined by a brake service manual and when brakes operate in a satisfactory manner acceptable to the instructor. Service must be performed in a time limit specified by instructor.

REQUIREMENTS:
1. Visual inspection of brake linings.
2. Check size of brake drum and lining with brake micrometer.
3. New linings must be cam-ground to size on brake lining cam grinder to fit drum.

RATIONALE: Proper brake operation is necessary if a vehicle is to be operated safely. The ability of a mechanic to perform precise brake work is an important task.

OUTCOME: The student will be able to replace brake linings.

TASK: **The Ability To Replace A Clutch**

CRITERION: Clutch replacement shall be acceptable for service when replacement procedures have been followed as outlined in manufacturers service manual. Clutch must operate in a satisfactory manner and the work completed in time specified by instructor.

REQUIREMENTS:
1. Visual inspection of clutch components.
2. Replacement requires special alignment tools.
3. Clutch replacement requires precise adjustment.

RATIONALE: Proper clutch operation is essential if transmission is to perform in a satisfactory manner. The ability of a mechanic to inspect, replace, and adjust a clutch is an important task.

OUTCOME: The student will be able to replace a clutch assembly.

TASK: **The Ability To Replace Axle Bearing**

CRITERION: Axle bearing will be judged acceptable for service when bearing replacement procedures have been followed as outlined in manufacturers service manual. Bearing replacement must be performed in time limit and must operate in a manner acceptable to instructor.

REQUIREMENTS:

1. Determine if bearing is defective.
2. Bearing replacement must be performed with special tools for removing axle, removing and replacing axle bearing.
3. Lubricate bearing if necessary.

RATIONALE: The task of rear axle bearing replacement is important if vehicle is to be a smooth and dependable means of transportation.

OUTCOME: The student shall have the knowledge and ability to replace the rear axle shaft bearing.

TASK: **The Ability To Adjust Front Wheel Toe-In**

CRITERION: Toe-in adjustment performance shall be acceptable when adjustment procedures have been followed as outlined in service manual. Adjustment must be made in specified time period set by instructor.

REQUIREMENTS:

1. Adjustment must be made and measured on proper wheel alignment and toe gauge.
2. Measurement must be within manufacturers specifications.

RATIONALE: Correct toe adjustment is probably the most important adjustment performed to the front wheels to prevent tire wear and increase steering stability. Therefore, the job of adjusting toe-in must be accurately performed by the mechanic.

OUTCOME: The student will be able to correctly adjust front wheel toe-in.

TASK: **The Ability To Replace Windshield Or Rear Glass**

CRITERION: The replacement of a windshield will be evaluated by the instructor for accuracy during installation. The student will replace both weatherstrip and glass and sealant-bound glass.

REQUIREMENTS: The student will have:

1. Windshield.
2. Windshield replacement tools.
3. New rubber channel or silicone mastic.
4. Specified time requirement will be set by the instructor.

RATIONALE: Windshields are frequently replaced because they are broken by various objects.

OUTCOME: The student shall be able to remove and replace a windshield or rear glass using weatherstrip and glass or sealant-bound glass.

TASK: **The Ability To Replace A Fender**

CRITERION: The fitting and alignment will be evaluated by the instructor for accuracy and appearance. The fender gap should be approximately 1/8 to 3/16 of an inch around the door and hood opening.

REQUIREMENTS: The student will have:

1. New fender.
2. Hand tools.
3. Student shall be able to replace and align the fender in one hours time given by flat rate book.
4. Time requirement will be specified by instructor.

RATIONALE: Fenders have to be replaced frequently and 1/8-inch clearance is approximately the right gap that is required anytime a fender is replaced.

OUTCOME: The student shall be able to remove, replace, fit and align a fender.

TASK: **The Ability To Replace A Door**

CRITERION: The fitting and alignment will be evaluated by the instructor for accuracy and appearance. The door gap should be approximately 1/8 inch.

REQUIREMENTS: The student will have:

1. New door.
2. Hand tools.
3. The student shall be able to replace and fit the door within the amount of time specified in the flat rate book.
4. Time requirement will be specified by the instructor.

RATIONALE: Doors have to be replaced frequently. 1/8 inch is approximately the right gap unless a special gap is specified by the instructor.

OUTCOME: The student shall be able to remove, replace and fit a door.

TASK: **The Ability To Replace A Hood**

CRITERION: The fitting and adjustment will be evaluated by the instructor for accuracy and appearance. The hood gap should be approximately 1/8 to 3/16 of an inch.

REQUIREMENTS: The student will have:

1. New hood.
2. Hand tools.
3. The student shall be able to replace, fit and align a hood within the amount of time specified in the flat rate book.
4. Time requirement will be specified by the instructor.

RATIONALE: Hoods have to be replaced frequently. 1/8 to 3/16 of an inch gap, as specified by the General Body Service Book, will be used unless a special gap is specified by the instructor.

OUTCOME: The student shall be able to remove, replace, fit and adjust a hood.

TASK:	**The Ability To Replace Front Or Rear Bumper**
CRITERION:	The replacement and alignment of a bumper will be evaluated by the instructor for accuracy and appearance. The bumper should be an equal distance at both bumper ends from the fender.
REQUIREMENTS:	The student will have: 1. New bumper. 2. New bumper brackets. 3. Hand tools. 4. The student shall be able to replace and align the bumper in a given time by the flat rate book or time requirement will be specified by the instructor.
RATIONALE:	Bumpers have to be changed frequently.
OUTCOME:	The student shall be able to remove, replace and align a bumper.

TASK:	**The Ability To Replace A Decklid**
CRITERION:	The fitting and alignment will be evaluated by the instructor for accuracy, appearance, gap, opening, and closing adjustment. The decklid gap should be approximately 1/8 inch for a good fit.
REQUIREMENTS:	The student will have: 1. New decklid. 2. Hand tools. 3. The student shall be able to replace, fit and align a decklid within the amount of time specified in the flat rate book. 4. Time requirement will be specified by the instructor.
RATIONALE:	Decklids are replaced frequently. 1/8 to 3/16 of an inch is approximately the gap that is specified by the General Body Service Book unless a special gap is specified by the instructor.
OUTCOME:	The student shall be able to remove, replace, fit and adjust a decklid.

TASK: **The Ability To Identify Spray Equipment**

CRITERION: The identification of the principle parts on spray equipment will be evaluated by the instructor. Students must be able to identify and assemble in proper order all spray equipment covered.

REQUIREMENTS: The student shall have:

1. Spray guns, siphon feed and pressure feed.
2. Air transformer.
3. Types of compressors.
4. Respirators.
5. Spray booth.
6. The student shall be able to identify the principle parts given by the instructor on spray equipment.

RATIONALE: Spray equipment is used for applying paint in automobile refinishing or in refinishing damaged panels that have been repaired or replaced.

OUTCOME: The student shall be able to identify the various items of spray equipment.

TASK: **The Ability To Identify Refinishing Materials**

CRITERION: The identification of refinishing materials will be evaluated by the instructor on the labeling and physical characteristics of each sample.

REQUIREMENTS: The student will have:

1. Paints.
2. Reducers.
3. Surfacers.
4. Compounds.
5. The student shall be able to identify the labeling and physical characteristics with correct accuracy given on the material containers.

RATIONALE: Identification of refinishing materials is critical. Refinishing materials are constantly used in refinishing damaged panels which have been repaired or replaced.

OUTCOME: The student shall be able to identify refinishing materials.

TASK: **The Ability To Select And Use Refinishing Materials**

CRITERION: The use of refinishing materials will be evaluated by the instructor on the selection and proper use of materials.

REQUIREMENTS: The student will have:

1. Paints.
2. Reducers.
3. Surfacers.
4. Compounds.
5. The student shall know the proper use of refinishing materials with correct accuracy given by the instructions on the labels of the materials begin used.

RATIONALE: Refinishing materials are constantly used in refinishing damaged panels which have been repaired or replaced.

OUTCOME: The student shall be able to use refinishing materials.

TASK: **The Ability To Do Surface Preparation**

CRITERION: The use of surface preparation materials to be used in the preparation of a surface to which paint will be applied will be evaluated by the instructor on appearance and for any imperfections in the metal or old paint.

REQUIREMENTS: The student will have:

1. Abrasive papers.
2. Masking tape and paper.
3. Power disc sander.
4. The student shall know the proper steps in preparation using the materials with correct accuracy given by the textbook.

RATIONALE: Surface preparation is necessary since damaged panels that have been repaired or replaced have to be surface prepared before paint can be applied to the surface.

OUTCOME: The student shall be able to prepare a surface properly for finishing.

TASK: **To Construct Outer Form Walls**

CRITERION: All concrete formwork is subject to city or county inspection and must conform to local building codes before concrete is placed. The finished form must also comply with the specifications and the blueprints. Forms will be acceptable when the local building inspector and the instructor have both signed the building card that is required on each job.

REQUIREMENTS: The student will construct the outside formwork for a designated dwelling, working only with information furnished from the blueprints and the specification sheets.

RATIONALE: The basic structure of any building is its foundation. How true the foundation is will depend on the ability of the personnel making the formwork.

OUTCOME: Given a single story residential dwelling, the student will be able to construct the formwork for the outer wall, align, brace and make ready for the pouring of concrete.

TASK: **To Construct Inner Form Walls**

CRITERION: All concrete formwork is subject to city or county inspection and must conform to local building codes before concrete is placed. The finished form must also comply with the specifications and the blueprints. Satisfactory work is indicated when the local building inspector and the instructor have both signed the building permit card that is required on each job.

REQUIREMENTS: The student will construct the inner formwork for the dwelling, working only with information furnished him on the blueprints and the specification sheets.

RATIONALE: The inner formworks must meet the specifications and be strong enough to withstand the placement of concrete.

OUTCOME: Given a single family residential dwelling the student will construct the formwork for the inner wall, align, brace, tie and make ready to receive concrete.

TASK: **To Salvage Form Materials**

CRITERION: The salvage operation will be deemed successful when all lumber has been removed from the form, cleaned of all nails, cement and other foreign matter, and stock-piled to prevent warpage. The exposed foundation form must also be inspected by the instructor to determine if any cracks were caused by salvage removal methods.

REQUIREMENTS: As soon as the foundation concrete has set long enough to warrant removal of the forms, the student will salvage the form lumber without cracking or maring the green cement.

RATIONALE: The salvage of formwork material is performed to lower the cost of construction by making the lumber ready for re-use in later framing.

OUTCOME: The student will be able to strip, clean and pile all form lumber used in the formwork for the foundation of a single family, one story dwelling.

TASK: **Sill Installation**

CRITERION: The sill placement will be accepted by the instructor only after he has checked the sill for level with the aid of a builders transit and found the sill to have no variance greater than one eighth of an inch.

REQUIREMENTS: As soon as the salvage of the form material for the residential dwelling has been completed the student will place the sill plates in compliance with the blueprints and any local code specifications.

RATIONALE: After the foundation forms have been removed, the next step in the construction of the dwelling would be the placing of the sill plates on the concrete foundation wall. The sill must be placed level and bolted tight to the concrete wall. A mistake here will show in the subsequent framing of this dwelling.

OUTCOME: The student will be able to drill foundation bolt holes in the sill plate, then place, align, level and bolt into place the sill as noted on the blueprints.

TASK: The Installation Of Foundation Girders

CRITERION: The girders must be spaced as specified on the plans, have all crowns up and the top edges should be level with the top edge of the mudsill. One-eighth of an inch level tolerance will be allowed when checked with a builders transit or by the tight string method.

REQUIREMENTS: The student will check the plans for girder size, and placement; he will also check size and placement of pier posts to support the girders.

RATIONALE: After stripping and salvaging the foundation formwork and the placing of the mudsill, the girders are installed to help support the interior weight load of the house.

OUTCOME: The student will construct, place, level and secure the foundation girders for a single family dwelling.

TASK: The Installation Of Floor Joists

CRITERION: The joists will be acceptable when they have been bridged and nailed to both the girders and the bridging according to the local building codes.

REQUIREMENTS: Given a single family dwelling with the foundation and girders already placed, the student will install the floor joists, complete with solid bridging. He will plan the joists with crowns up and space them as specified on the blueprints. Allowance must be made for air vents in the rim and header joists.

RATIONALE: After the girders and sills have been placed, the next operation is installing the floor joists. In order to prevent joists from springing sideways under a load, which would reduce their carrying capacity, they are tied together with solid bridging blocks or reinforced with cross bridging.

OUTCOME: The student will be able to install and bridge the floor joists and make ready for the laying of sub floor.

TASK: **The Installation Of Sub-Floor**

CRITERION: It is the responsibility of the student to check the plans against all rough plumbing installation before he covers the floor joists. The student will also be graded on tightness of joints, nail spacing, methods used, and the accuracy of perimeter measurements.

REQUIREMENTS: The student will be given a single family dwelling in which all work prior to the laying of the sub-floor has been done.

RATIONALE: The sub-floor is the next operation after the placing of the floor joists. It serves as a base for the finish floor and provides both strength and insulation.

OUTCOME: The student will be able to cut, place, and nail all materials used to cover the floor joists.

TASK: **Installation Of Floor Plates**

CRITERION: Sole plate installation will be accepted after each room size has been checked against the plans by the instructor.

REQUIREMENTS: With the aid of the blueprint, the student will place the sole plates for all interior rooms and exterior walls.

RATIONALE: The floor plate is the lowest member of a framed wall or partition when framing by the Western or Platform method. It is nailed to the subfloor and joists to locate and stabilize the walls of a house.

OUTCOME: The student will be able to install and align all floor (sole) plates for a single family dwelling.

TASK: **The Construction Of Headers**

CRITERION: Headers will be accepted for installation after the instructor has checked them for length, width, and noted that the size and location has been written on each.

REQUIREMENTS: The student will study the blueprint for size and location of all openings. He will then construct all headers required for the residence using the built-up header technique.

RATIONALE: In order to allow for an opening in a wall, some means of load support must be used to replace the studs that have been removed. This is done by the use of headers. The larger the opening, the larger the header.

OUTCOME: The student will be able to construct all headers to be used in the erection of all walls in a single family dwelling.

TASK: **Window And Door Opening Layout**

CRITERION: The student will be graded on the accuracy of the layout and on the length of time involved for the layout of the windows and doors.

REQUIREMENTS: Given a blueprint of a single family dwelling the student will layout all studs on 16 inch centers and mark the centers of all openings. He will use the width of the desired opening plus 6 inches to allow for header, trimmers and joints installation.

RATIONALE: After the sole plate has been installed, the top plate is cut to match the sole plate and markings for the location of all studs, headers, and trimmers are placed on both plates at the same time. This is done to simplify alignment.

OUTCOME: The student will be able to layout the framing dimensions for all door and window openings in a single family dwelling.

TASK: **Record Business Transactions In General Journal Form**

CRITERION: To record all assets, liabilities, and changes in owner's equity.

REQUIREMENTS:

1. Identify business activity as a transaction.
2. Write the entry in standardized way to proper standardized form.
3. Analyze the equality of debits and credits recorded.
4. Word an explanation.

RATIONALE:

1. The journal entry is basic input for any accounting system.
2. The terminology of account titles used, and their mathematically computed values assist in statement analysis.

OUTCOME: The student will be able to analyze any business transaction and record it in the journal of the accounting system.

TASK: **Recording Business Transactions In Special Journals**

CRITERION: Record with an equality of debit and credit changes in asset, liability, and owner equity accounts.

REQUIREMENTS:

1. Determine what kinds of transactions are most common and use the journal that is appropriate for the recording.
2. Design journals for a minimum of recording and posting.
3. Record accurately to these journals the varied transactions of business.
4. Cross foot the totals for check of accuracy.

RATIONALE:

1. Well designed and properly used journals save time and minimize errors while producing the same results as the general journal.
2. Provides continuing analysis of transactions and their effect on the Assets = Liabilities + Equity equation.
3. Special journals teach good system design.

OUTCOME: The student will be able to record any business transactions using a proper journal.

TASK: **Posting To Ledgers**

CRITERION: All posting must be accurate.

REQUIREMENTS:

1. Choose and arrange in order the journals to be used.
2. Do the "current" posting.
3. Do column posting.
4. Use appropriate cross reference notations in the journals and the ledger.
5. Make postings to appropriate places in the ledger accounts.

RATIONALE:

1. Posting is essential to the summarizing of account balances. Totals are needed for statement presentation.
2. Inaccurate posting will prevent balancing of books and/or incorrect statement preparation.
3. The routine order of posting minimizes errors and the time consuming effort of locating the errors if made.

OUTCOME: The student will be able to summarize journal data into separately-titled ledger accounts.

TASK: **Recording Subsidiary Information**

CRITERION: The detail is considered properly recorded when a schedule of the detail agrees with a total of the general ledger control account.

REQUIREMENTS:

1. Design the required subsidiary records.
2. Either post to the subsidiary accounts from journals or use the subsidiary information to prepare the journal entry.
3. Check the accuracy of the subsidiary accounts by checking that their balance agrees with the balance of the controlling account.

RATIONALE:

1. The need for additional information justifies the effort required to provide it.
2. The check of "detail" against "control" provided checks of accuracy and clues for finding errors.
3. Errors must be corrected.

OUTCOME: The student will be able to recognize and record pertinent detail in addition to the general ledger account summaries.

TASK: **Prepare The Worksheet That Plans The Year-End Adjustments And Statements**

CRITERION:

1. The balances of all accounts previously recorded must balance as to debits and credits.
2. The worksheet will be considered complete when all accounts have been analyzed for needed adjustments and these adjustments have been planned with an appropriate adjustment to the equation: A = L + E.
3. The adjusted balances of temporary (Income Statement) accounts must produce a profit equal to the changes noted in the permanent (Balance Sheet) accounts.

REQUIREMENTS:

1. Properly ruled forms are to be used.
2. Record on the worksheet a trial balance of ledger accounts that balance.
3. Indicate as "adjustments" the changing balances of accounts resulting from the accrued and deferred considerations.
4. Classify all adjusted balances and Income Statement debit or credit or as Balance Sheet debit or credit.

RATIONALE:

1. The worksheet provided a useful planning device.
2. Errors needing attention will be detected.

OUTCOME:

The student will be able to:

1. Check the accuracy of previously recorded transactions.
2. Plan the adjustments needed to update the ledger accounts for the accrued and deferred items.
3. Separate the elements of the Income Statement and Balance Sheet facilitating the preparation of those statements.

TASK: **To Plan Adjustments**

CRITERION: All balance sheet accounts should be investigated and updated for any "material" unrecorded changes.

REQUIREMENTS:
1. Plan as many adjusting entries as are required.
2. Emphasize the resultant effect on the Income Statement as being more important than the Balance Sheet.
3. Provide detailed explanations to accompany each entry.

RATIONALE:
1. The final statement preparation cannot reflect all business activity effecting the profit without these adjustments.
2. The very essence of accounting theory is the matching of revenue and expense as experienced in the preparation of these entries.

OUTCOME: The student will be able to provide ledger accounts with previously unrecorded data.

TASK: **To Prepare The Income Statement**

CRITERION: The income statement will be considered acceptable when it reports the proper profit in an appropriately classified manner.

REQUIREMENTS:
1. Items of profit are transferred from the worksheet to the income statement and organized in appropriate classifications according to function.
2. Income statements are prepared for merchandising, service businesses, manufacturing.

RATIONALE:
1. Business activity requires knowledgeable analysis of income statements for decision making.
2. The best way to understand an income statement is to prepare one from the basic elements up.
3. The income statement is a prime tool of management.
4. The income statement is of importance to investers and creditors as well as management.

OUTCOME: The student will be able to prepare a classified income statement in an acceptable format.

TASK: **To Prepare The Balance Sheet**

CRITERION: The finished balance sheet will be considered acceptable when it presents the information in classified form and does not violate any accounting principles or concepts.

REQUIREMENTS:

1. Balance sheet items are transferred to the statement from the worksheet and summarized in classified form.
2. Balance sheet must be properly balanced, rules, and footnoted.

RATIONALE:

1. The balance sheet is the universally accepted evidence of a business's value.
2. The balance sheet is the prime product of the auditors opinion that "the statements fairly reflect the condition of the business".
3. The balance sheet is a tool of management, creditors, and investors.

OUTCOME: The student will be able to prepare the balance sheets properly classified as to kinds of assets, liabilities and owner's equity.

TASK: **To Record Closing Entries**

CRITERION: The student has performed successfully when all income statement accounts (profit producing) are closed to the Retained Earning account and the books continue to remain in balance.

REQUIREMENTS:

1. Journalize compound general journal entries to close the income statement accounts as listed on the worksheet to an Income Summary account.
2. Close the Income Summary account to the Retained Earnings account.
3. Prepare a post-closing trial balance.

RATIONALE:

1. The temporary accounts have served their summarizing function for the period. They should be closed.
2. The permanent accounts are uncluttered by this technique. Only the Retained Earnings account is affected by the final profit.
3. Books are ready for a new accounting cycle.

OUTCOME: The student will be able to close the temporary accounts to zero balances, transfer the profit to a permanent account, and have books balanced and ready for the start of a new accounting cycle.

TASK: **Analyzing Results Of Accounting Data**

CRITERION: Objective examinations will verify the needed basic understanding of the principles and concepts of statement analysis. The student will be able to produce from statements requested ratios.

REQUIREMENTS:
1. Compute ratios.
2. Make some assessment as to the success of the business as reported.
3. Make comparitive statements with previous years.
4. Select the appropriate analyzing techniques for a particular situation.

RATIONALE: Statements and their analysis are tools of owners and management. They are of value to the client of the accountant. He pays for the knowledge they provide.

OUTCOME: The student will be able to:
1. Bring attention to needed internal control.
2. Emphasize the effect errors have on the reported results.
3. Estimate the values that should exist to be compared with the physical counts of assets.
4. Observe the flow of costs in a manufacturing business.
5. Observe the results and compare to predetermined criteria.

TASK: **To Understand Percentage Analysis, One Of The Important Functions Of The Accountant**

CRITERION: To calculate the ratios of certain cost, income, and expense accounts to gross sales.

REQUIREMENTS:

1. Given a profit and loss statement showing expenses as percentages of sales, broken down into total, parts, and service.
2. In blank spaces on the profit and loss statement, provide the required ratios.
3. Convert the ratios to percentages.
4. Compare the percentages for total to those for parts and for services.

RATIONALE:

1. The accountant and the business firm use the profit and loss statement as a management tool.
2. The percentage analysis offers the best means of comparison between departments.
3. The percentage analysis is the best means of comparing one accounting period to others.

OUTCOME: The student will be able to apply the concept of percentage analysis as shown on the income statement.

TASK: **To Learn The Application Of Markup As Used By The Retailer**

CRITERION: To calculate the markup based on cost and the markup based on retail in four situations.

REQUIREMENTS:

1. Given two equations:
   Markup as a percent of retail divided by 100% - markup as percent of retail equals markup as percent of cost.
   Markup as a percent of cost divided by 100% + markup as a percent of cost equals markup as a percent of retail.
2. Convert markup on cost to the equivalent markup on retail. Convert markup on retail to the equivalent markup on cost.
3. Apply the converted markup to the appropriate given situation.
4. Compare the markups in terms of application by the retailer.

RATIONALE:

1. The markup procedure is vital to a successful retail business, cost, profit relationship must be fully understood.
2. Markup procedure in fast turnover operations is more complex than in small or slow turnover operations.
3. Markup equations are the key to markup conversion tables.

OUTCOME: The student will be able to apply markup techniques to either the cost or the retail price.

TASK: **To Learn The Importance Of Life Insurance And Understand The Conditions Under Which It Is Purchased**

CRITERION: To discern orally and by examination questions the difference between term insurance and the many other cash value life insurance policies.

REQUIREMENTS:

1. Given a special ledger statement illustration, for a whole life policy, for $25,000, for a male, taken out at age 20.
2. Show the cash value build up to age 65 and the paid up insurance to age 65.
3. Show the dividend build up to age 65 and the cost of the insurance if the dividends are used to reduce the premium.
4. Show the dividend build up to age 65 and the increase in cash value to age 65 if the dividends are used to purchase paid up additions.
5. Compare term policy to the whole life policy.

RATIONALE:

1. The student is in a position to purchase some life insurance at his age due to the low premium.
2. The student needs to know where he can fit a life insurance policy into his budget and how he can upgrade or increase the policy at a later date.
3. The student needs to know that life insurance is not an investment.

OUTCOME: The student will be able to differentiate between protection and cash value concepts in life insurance policies.

TASK: **To Show The Use Of Statistical Inference**

CRITERION: Correct solution to computation of four statistical measures.

REQUIREMENTS:

1. Given 31 test scores; given four commodity prices, which make up the consumer price index for the base year and current year.
2. Arrange the test scores into an array.
3. Compute the mean, median and mode from the test scores.
4. Determine a weighed aggregative index from the commodity prices.
5. Compare the current year to the base year from the weighed aggregative index to find the consumer price index.

RATIONALE:

1. The statistical measure, mean, median and mode are used to analyze sales, budgets, weather, political and governmental activities.
2. Differences in the three averages, mean, median and mode are revealed.
3. The Consumer Price Index is one of the most important means of analyzing inflation and showing cause for wage increases.

OUTCOME: The student will be able to apply statistical data to problem solving.

TASK: **To Illustrate The Purpose Of "Hedging" In The Commodity Market**

CRITERION: To discern orally and by examination questions the difference between the cash market and futures market and how the two markets are used by the hedger.

REQUIREMENTS:

1. Given the conditions of the cash market and the futures market for different dates.
2. Given an explanation of how the cash market and futures market tend to fluctuate in the same direction.
3. Observe the results of a straight cash transation.
4. Observe the results of a complete hedging transaction.
5. Compare the cash transaction with the hedging transaction.

RATIONALE:

1. Dealing in futures for speculation purposes can be very lucrative or very risky. The student is made aware of this.
2. Hedging on the commodity market is legitimate and very necessary for the producer, processor, and seller to protect them from a severe drop in price due to seasonal conditions.
3. Speculation is necessary for the commodity changes to operate.

OUTCOME: The student will be able to analyze the concept of hedging in the commodity market as used by the producer, processor, and seller.

TASK: **To Understand The Technique Of Control Implemented By The Holding Company**

CRITERION: Correct solution to problem solving, involving capitalization of two - level holding companies and four - subsidiary companies.

REQUIREMENTS:

1. Given the capitalization of 4 subsidiary companies through bonds, preferred stock, and common stock.
2. Calculate 50% of the common stock of the 4 subsidiary companies.
3. Determine necessary capitalization for second level company to control subsidiary companies.
4. Determine necessary capitalization for top level company to control second level company.
5. Understand principle of holding company as it progresses to a higher level.

RATIONALE:

1. Understanding the principle of holding company control demonstrates the possibility of control with little capitalization.
2. The need for regulating legislation (Public Utilities Holding Company Act) is shown.
3. An awareness of the varieties of business organizations and structures.

OUTCOME: The student will be able to identify the technique of holding company control and the limitations of the control.

TASK: **To Understand The Principle Of Property Taxation**

CRITERION:

1. Computation of taxation problems to nearest dollar.
2. Oral response to Williamson Land Act, 100% assessed valuation concept, market value, assessed value.

REQUIREMENTS:

1. Given the assessed value of residential property, the tax rate and the market value in three different situations.
2. Compute the market value of the property.
3. Compute the assessed valuation of the property.
4. Calculate the property tax.
5. Explain the "open space" concept, the "100%" concept, and the "25%" concept.

RATIONALE:

1. Understanding of property taxation indicates the burden, the need, and reform regarding residential and business property.
2. The relevancy of property tax education is born out in municipal election propositions.
3. The 100% concept, 25% concept, and the Williamson Act (open space) are important tax issues to the businessman and the public today.

OUTCOME: The student will be able to apply the principle of property taxation problems.

TASK: **To Recognize The Difference Between Apparent And Effective Rates Of Interest**

CRITERION:

1. Understanding the use of loan amount and dollar cost of loan.
2. Use of effective rate of interest formula.

REQUIREMENTS:

1. Given dollar amount of loan, dollar cost of loan, and loan period for four loan situations.
2. Given the effective rate of interest formula.
3. Compute apparent rate of interest.
4. Insert knowns into effective rate of interest formula and compute effective rate of interest.
5. Compare the apparent rate and effective rate for the four loans.
6. Explain the difference between the rates in the four situations.

RATIONALE:

1. An understanding of interest charges expedites transactions between consumer and business firm and between borrower and lender.
2. The effective rate of interest concept reveals the advantage of a lump sum loan repayment.
3. The effective rate of interest shows a direct relationship to the truth-in-lending law.

OUTCOME: The student will be able to determine the difference between apparent and effective rates of interest.

TASK: **To Understand The Fundamentals Of Federal Reserve Policy**

CRITERION: To demonstrate orally and through written examination an understanding of the controls which may be placed on the money supply.

REQUIREMENTS:
1. Given the tools available to the Federal Reserve to control money reserves – discount rate, open market operations, reserve requirements.
2. Show, by means of graph, how a change in the reserve requirement through the use of each of the tools makes more or less money available to the monetary supply.
3. Interpret the graphic representation.
4. Defend monetary controls.

RATIONALE:
1. The strength of the dollar in the world market has been maintained through a sound monetary control.
2. Monetary controls explain the fluctuation of interest rates.
3. Monetary controls explain the lending policy of the banking system.

OUTCOME: The student will be able to apply his knowledge to the fundamentals of Federal Reserve policy to the concept of tight versus plentiful money supply.

TASK: **To Understand The Function Of The Stock Exchanges**

CRITERION: To explain through project and examination the operation of the stock changes and how they affect the business firms.

REQUIREMENTS:

1. Given ten companies listed on the New York Stock Exchange.
2. Show the changes which occur in the companies stock standings during the period of ten days.
3. Explain the various figures for the companies as shown on the financial page.
4. Explain how the changes shown on the financial page affect the actual companies.
5. Explain how the Dow-Jones Average is computed and how it is used.

RATIONALE:

1. Activity on the stock exchanges serves as an economic indicator for the United States.
2. Buying and selling stock through the stock exchanges is done for growth and speculative purposes.
3. Business firms are dependent upon the stock exchanges.

OUTCOME: The student will be able to apply the functions of the stock exchanges in relationship to the capitalization of business firms.

TASK: **The Ability To Apply The Philosophy Of Personnel Management Through Emphasis On Modern Techniques**

CRITERION: Each student will be required to show a proficiency rating of at least 60 on a scale of 100. There will be three (3) mid-term examinations and one final examination which will be comprehensive.

REQUIREMENTS:

1. Each student will be required to participate in case analysis combined with role playing.
2. Each student will be required to prepare a research paper as a term project based on a topic of his own choosing, but one that is related to the contents of the course.

RATIONALE: In order to function efficiently, the Personnel Manager must know the history and present status of this occupation in the United States.

OUTCOME: The student will understand the various possible policies and philosophies that help determine the course of industrial personnel programs.

The student will be familiar with the various roles played by unions in the development and maintenance of personnel policies.

The student will see the connection between government and industry as exemplified through modern industrial relations.

TASK: **To Perform A Job Analysis**

CRITERION: The student will be measured through the use of subjective as well as objective testing and observations. He should obtain at least 65 on a scale of 100 without the use of text or other reference material.

REQUIREMENTS: The Job Analyst may obtain job information by interviewing employees in each of the jobs and/or their supervisors, by having either of these groups complete questionnaires covering their jobs, by observing the jobs being performed and by checking available production records. In many instances, all of these sources may be utilized.

RATIONALE: Because this job requires a rather high degree of analytical ability and writing skill, it sometimes can serve as the initial job for college graduates who are seeking a career in the field of personnel management.

OUTCOME: The student will be able to follow through a simulated case in which he must show an understanding of the various functions of the job, and he should be able to ascertain certain primary principles in this area.

TASK: **To Establish Program Objectives**

CRITERION: The evaluation will be based upon examination.

REQUIREMENTS: The student shall prepare objectives for specific areas in personnel management as determined by the instructor, and accomplish this task to within 25% of the desired outcome. All necessary standards to be set by the instructor.

RATIONALE: It is also difficult to prescribe remedies for shortcomings in a program if you do not know what the specific results should have been.

OUTCOME: The student will be able to establish objectives for all the personnel functions.

TASK: **To Conduct An Interview**

CRITERION: The student will be measured through the use of subjective as well as objective testing and observations. He should obtain at least 65 on a scale of 100 without the use of text or other reference material.

REQUIREMENTS: The student will be required to handle an interview on his own, combining both the formal or directive approach as well as the informal or non-directive approach.

RATIONALE: Interviewing has been the most universally used tool in personnel management of all those skills employed. Therefore anyone who is working in the field must know and be able to use some of the techniques involved in interviewing.

OUTCOME: The student should be able to actually handle an interview, but only to the extent that he would be able to follow necessary steps needed to carry out an ordinary simple interview.

TASK: **To Give Practice In Grievance Handling**

CRITERION: The student will be tested by the instructor and must score at least 85% in order to be considered proficient.

REQUIREMENTS: The student will be required to know the 4 basic grievance situations:

1. Basic considerations of grievance handling
2. Steps in handling grievances
3. Principles of handling grievances
4. Machinery for handling grievances

He should be able to understand and construct a grievance clause for a union-management agreement, both from the standpoint of the union as well as from the standpoint of management.

RATIONALE: A common impression of labor-management relations is that they are generally dissatisfactory. Because of this fact, dissatisfaction then shows itself in lost-time due to labor conflict, it behooves management to exert effort to reduce employee dissatisfaction.

OUTCOME: The student should be able to identify the type of grievance and indicate the techniques for handling it.

TASK: **Training Instructors**

CRITERION: The student must pass an examination on his understanding of the learning process, as well as the functions of a good teacher. He must pass this examination with a score of 85 on a scale of 100 without the aid of a text or any other reference material.

REQUIREMENTS: The student will be responsible for the preparation of a teaching situation, based upon a topic which will be selected by the instructor.

RATIONALE: In industry, it is necessary to have qualified instructors to teach many of the in-service training courses. Therefore, since most of these people come from the ranks of the personnel department, it is necessary that the department make sure that competent teachers are available. Research indicates that when instructors are given training the trainees will show much greater progress than when the instructors are not given such training. Therefore, it is necessary that this aspect of personnel management be included here.

OUTCOME: The student will show that he has a complete understanding of general teaching techniques, and he must be able to follow-up with an effective evaluation of his training methods and techniques.

TASK: **To Conduct A Personnel Recruitment Program**

CRITERION: The student will be tested through the use of an objective examination. He should be able to pass this test with a score of 70% or better.

REQUIREMENTS: The student will be required to do a research paper on advertising for labor and casual labor sources.

RATIONALE: Personnel procurement may be defined as the task of hiring people to fill current or future job vacancies. This is one of the most important functions of the personnel manager and those who are going to be involved in personnel must have some expertise in this area.

OUTCOME: The student will be able to handle any of the general functions of the procurement of human resources.

TASK: **Preparation Of Training And Development Programs**

CRITERION: Measurement in this case will be through examination and interview, with the examination providing 60% of the grade and the interview providing the other 40%.

REQUIREMENTS: The student will prepare a training program for a specific job without any assistance from anyone other than some very indirect guidance by his instructor. He should be able to use any and all references necessary for this assignment.

RATIONALE: Both of these areas are necessary to any manager in business, and consequently both of these areas are important as far as this course is concerned.

OUTCOME: Each student should be able to prepare at least one simple training program for a general job specification.

TASK: **Conducting Union-Management Negotiations**

CRITERION: The student will be tested through the use of objective testing and should score at least 85 on a scale of 100.

REQUIREMENT: He will further have to show a certain amount of expertise by being required to analyze several problems offered in case form.

RATIONALE: The basic objective of union-management relations is to establish an agreement regarding the conditions under which employees will render their services to the employer. These relations are governed in part by legislative rules. They are also subject to a variety of economic, administrative, and personal forces which the parties can bring to bear. Because of the importance of this area to the area of personnel management, there is a need to include this in the course.

OUTCOME: Each student should be able to recognize the various factors bearing on the union-management relationship, including the legal aspects of the situation, and understand the preparation of negotiated agreements, negotiation with unions, the subject matter of agreements, and the problems of living with the contract after it has been negotiated.

TASK: **Morale Development**

CRITERION: The student must show a reasonable amount of expertise with the problem, and be able to score at least 75 on a scale of 100 as far as the objective test is concerned.

REQUIREMENTS: The student will be tested through an objective test, and be required to show his ability to apply this knowledge to an actual case, which will be prepared by the instructor, using various information available for this purpose.

RATIONALE: If management is to communicate its views effectively, it must be aware of what people know, feel, and believe. It must determine the morale and attitudes of the lower levels of the organization. The matter of morale development is a just and correct subject to be included under Personnel Management.

OUTCOME: The student will have an understanding of the importance of this area to personnel management. He should have a comprehensive understanding of the logical sequence of morale development, the essence of morale and finally the effects of good morale on the working environment.

TASK: **To Construct Correctly Most Words Of A Standard Business Vocabulary**

CRITERION: The student must maintain an average of 90 per cent accuracy in five dictated tests of isolated words of presented shorthand theory, using standard business vocabulary.

REQUIREMENTS:
1. The tests will be 100-word tests of standard business vocabulary.
2. The tests will be dictated at no more than six words per minute.
3. The student will be allowed the use of a dictionary during transcription.
4. Errors will be counted for incorrectly written outlines, omitted words, misspelled words in transcription, and words out of dictated order.

RATIONALE: A good command of the basic theory foundation of Gregg shorthand is essential if the student is to be able to phonetically reduce any dictated word to a shorthand outline.

OUTCOME: The student will, through phonetic analysis and response, be able to construct correctly most words of a standard business vocabulary.

TASK: **Quick And Accurate Response To Material Related To Brief Forms**

CRITERION: The student must pass with a minimum of 95 per cent accuracy five dictated tests of brief form material.

REQUIREMENTS:
1. The test will be of sufficient length to cover the brief forms presented to that point, including brief forms, brief form dirivatives, and brief form phrases.
2. The test will be dictated at no more than 24 items per minute.

RATIONALE: Brief forms are those words that appear frequently in business correspondence. Instant response to them is essential as the foundation for the ability to take rapid dictation.

OUTCOME: The student will be able to respond quickly and write accurately material related to brief forms.

TASK: **The Ability To Take Dictation Within A Specified Time Limit**

CRITERION: The student must transcribe the dictated material with at least 95% accuracy.

REQUIREMENTS:
1. Dictation will be for three minutes.
2. Dictation will be at a rate of no less than 40 words a minute and up to a speed appropriate for the fastest writer.
3. The accuracy percentage will be based on an error count that considers as errors words omitted in the transcript, proofreading errors, misspelling, wrong word choices, and major punctuation errors.
4. The student's three highest dictation speed rates with at least 95% accuracy will be proof of his ability in taking connected, new material dictation.

RATIONALE: While the ability to phonetically analyze and construct isolated words is important and demonstrates theory knowledge, the final result of theory study should be the ability to put to practical use the construction of outlines as dictated in connected matter.

OUTCOME: The student will be able to take connected, new-material dictation at a minimum rate within a specified time limit.

TASK: **To Utilize Nonshorthand Skills Related To The Transcription Of Written Material**

CRITERION: Counted as errors against the student in the transcript will be those made in the nonshorthand skills in areas of proofreading, spelling, making correct word choices, punctuation, grammar. The student must also pass, with satisfactory performance, tests given in those areas indicated.

REQUIREMENTS: Tests will be given in the following areas:
1. Punctuation
2. Spelling
3. Proofreading
4. Correct word choice.
5. Grammar

RATIONALE: Application of these nonshorthand skills in transcription will produce usable, or "mailable" work, the intended meaning of which will not be obscured by an error of the nature described.

OUTCOME: The student will be able to utilize nonshorthand skills related to the transcription of the written material.

TASK: **The Ability To Use Proper Indexing Order In Filing**

CRITERION: The student must index correctly a minimum of 75% of the names within a time specified by the instructor.

REQUIREMENTS: The test will list 30 names representing problems to be found in individual's names, business firm names, service organizations, schools, churches, governmental agencies, etc.

RATIONALE: Misfiled correspondence or other documents are temporarily (or perhaps permanently) lost to an organization.

OUTCOME: Given a list of names, the student will be able to rearrange them in proper indexing order.

TASK: **The Ability To Cross Reference Filing Material**

CRITERION: Out of ten names needing cross referencing, the student must be able to recognize and select at least eight. Of those eight, the student will indicate which name appears on the cross reference and in what indexing order.

REQUIREMENTS: Included in those names must be a representative of the following:

1. Married women's names
2. Foreign names
3. Newspaper names
4. Magazine names
5. Business names doing business under another name or under more than one name.
6. Business names including more than one individuals name.
7. Names of agents (trustees, guardians, etc.) and their clients.

RATIONALE: The possibility of correspondence being filed under one name but being called for under another precludes the necessity for cross referencing.

OUTCOME: Given the same list of names in MPO No. 1, the student will be able to select those needing cross referencing.

TASK: **The Ability To Select The Key Title And Code It Correctly**

CRITERION: Out of a set of 50 pieces of correspondence, the student will be allowed a maximum of 9 errors for a passing grade.

REQUIREMENTS:

1. After making his selection of the key title and coding that selection, the student will arrange the correspondence in appropriate order (alphabetic, geographic, numeric, or subject).
2. He will indicate that order on an answer sheet.
3. The instructor, at the time he checks the answer sheet, will also, on a random basis, check the student's work for correct coding practices.

RATIONALE: Correspondence filed under the wrong key title is considered misfiled and thereby lost to the organization.

OUTCOME: Given a set of correspondence, the student will be able to select the key title for each item in the set and code that key title correctly.

TASK: **The Ability To Retrieve Requested Correspondence Within A Specified Time**

CRITERION: The student must, in a series of four tests, find requested materials within a time limit average of no more than eight minutes.

REQUIREMENTS:

1. Tests of a minimum of ten names each will be constructed for each of four methods of filing: alphabetic, geographic, numeric, and subject.
2. The names requested will be of increasing difficulty with each test.
3. The timing of each test will continue until all the correspondence for the names given has been found and recorded.

RATIONALE: Objective knowledge of filing rules and procedures alone is not necessarily indicative of how the student will respond in a practical "retrieving" situation. These timed tests will, in a simulated way, allow the student to work under the pressure of producing requested materials.

OUTCOME: Given a set of correspondence, the student will be able to select the key title for each item in the set and code that key title correctly.

TASK: **The Ability To Operate A Stencil Duplicating Machine**

CRITERION: The student must demonstrate to the instructor considerable facility in the operation of the machine, making whatever adjustments are necessary for good final copies.

REQUIREMENTS: Demonstrated machine adjustments as the following:

1. Making vertical adjustments of the cylinder.
2. Making horizontal adjustments of the cylinder.
3. Making angular adjustments to correct placement.
4. Adjusting the speed for the desired ink flow.
5. Making paper-table and receiving-tray adjustments for different sized paper.
6. Checking and filling (if necessary) the ink supply.
7. Stopping the machine in the proper position and setting the brake.

RATIONALE: While the majority of duplicating done in an office is through carbon-copy typing, the possibility always exists that numerous copies of any work might be needed. The office worker must, therefore, be prepared to produce work on duplicating machines; and the stencil duplicating process is a very common method.

OUTCOME: The student will be able to operate a stencil duplicating machine with efficiency.

TASK: **The Ability To Use A Stencil**

CRITERION: The student must satisfactorily duplicate six assignments during a period of time specified by the instructor.

REQUIREMENTS:

1. The assignments will be arranged in order from the simple to the complex.
2. The assignments will include:
   a. A simple, typewritten form letter with a handwritten postscript, the address and salutation omitted for fill-in.
   b. A simple line poster of a large figure with some appropriate copy.
   c. A lettering assignment, combined with a typewritten tabulation.
   d. A line drawing advertising a product, with shaded figures and appropriate headlines in lettering-guide work.
   e. A french-fold, centering a design in each quarter.
   f. A four-page program with appropriate design and copy.
3. Each assignment will be rated on a four-point grading scale, graded subjectively on good lines, good shading, good lettering, and centering (as they are appropriate). No points will be given any assignment with uncorrected errors in the copy.
4. The student will be reassigned any job for which he does not receive at least two points, with a total possible of four.
5. The student receiving less than a satisfactory grade on any of the above assignments will be required to re-do the assignment.
6. The student will, upon completion of each assignment, duplicate his work on an available stencil duplicating machine.
7. The work shall be planned for and run on 8½ by 11 inch paper.

RATIONALE: The final copy of any stencil-duplicated work can be no better than the image has been prepared on the stencil itself. It is important, therefore, that the office worker have the ability and experience to do good stencilization.

OUTCOME: The student will be able to write, draw, and letter on a stencil.

TASK: **Development Of Personal Qualities**

CRITERION:

1. Daily performance in the classroom.
2. Reports of dentists during clinical training.

REQUIREMENTS:

1. Good physical health and personal grooming.
2. Proper attitude toward peers and instructors as well as the profession.
3. Initiative to carry out instructions and recognize areas of work to be completed.
4. A personality compatible to working with other students, patients, instructors, and the general public.

RATIONALE:

1. It is important to maintain good personal health in order to develop the proper attitude toward the duties of the profession.
2. Have the initiative to progress and acquire new skills.
3. To be capable of working with others.

OUTCOME: The student should be a well-groomed assistant with attributes which assist in creating pleasant working conditions, and who will be highly instrumental in attaining and maintaining patients for growth of the dental practice of her employer.

TASK: **Physical Health And Grooming**

CRITERION:

1. Attendance records.
2. Reports of medical appointments to be made to instructor.
3. Evidence of dental health obtained through dental radiographs made by students.
4. Acceptable oral hygiene techniques demonstrated.
5. Immaculate personal grooming and attire.

REQUIREMENTS:

1. Regular medical examinations.
2. Correction of any minor physical defects.
3. All personal dental repairs are to be maintained and regular practice of good oral hygiene.
4. Diet and weight control.
5. Personal grooming, professional attire and hair styling.

RATIONALE:

1. The volume of patient appointments is based upon well-groomed personnel being on duty.
2. Excessive weight is a detriment in performing duties.
3. The practice of preventive health is utilized in patient contact and education.
4. Rest and recreation are conducive to proper attitudes toward the profession as well as maintenance of physical health.

OUTCOME:

The student will be:

1. Absent only for medical or dental appointments.
2. In good physical and dental health as a representative of the profession.
3. Capable of encouraging patient cooperation.

TASK: **Communication In The Dental Office**

CRITERION:
1. Acceptable and effective use of dental terminology.
2. Demonstration of telephone techniques by completion of two role playing situations and answering the department telephone.
3. Professional value of the visual aids and devices for patient information.
4. Satisfactory completion of the records designated by the instructor(s).

REQUIREMENTS: Methods of communication will be established during the entire two-year program through the:
1. Utilization of proper dental terminology.
2. Use of accepted telephone techniques.
3. Development of methods and devices for patient information (education).
4. Maintaining and accounting for patient services and office expenses.
5. Preparation of recall and collection letters for patients.

RATIONALE: The importance of the use of dental terminology is of primary importance for communication between the dentist and his staff for performing, recording and reporting patient services on the legal records. Good patient relationships depend greatly upon all other communicating services.

OUTCOME: The student will:
1. Effectively use dental terminology for professional purposes and in explanation to patients.
2. Be experienced in the use of the telephone in various situations.
3. Be able to prepare and use visual aids after employment.
4. Develop sample recall and collection letters to be included in a Manual of Procedures.

TASK: **Correct Use Of Dental Terminology**

CRITERION:

1. Ability to classify the anatomy of a skull with proper terminology.
2. 100% accuracy in recording dental caries by dictation of the instructor.
3. Identification of pathology found in radiographs.
4. Application of terminology to the dental specialties.

REQUIREMENTS:

1. Use diagrams and radiographs to identify the tissues of the teeth and supporting structures.
2. Establish the chronological age by drawings and radiographs in the growth and development of the teeth.
3. Models, carvings, charts, and radiographs will be used to identify tooth classifications, surfaces and landmarks.
4. Visual examination and radiographs will be used to identify pathology and anomalies.

RATIONALE: The terminology used is the universal language of the dental and medical professions which permits understanding of findings, services, or recommendations internationally useful. Accuracy in recording services performed is mandatory for use in legal proceedings or for individual identification.

OUTCOME: The student will be able to:

1. Communicate with the dental and medical professions.
2. Pass on information in lay terms to the patients.
3. Maintain complete and accurate patient treatment records using the correct terminology.

TASK: **Patient Information (Education And Communication)**

CRITERION: The student will be judged on the:

1. Originality of education method.
2. Patient-value as determined by the class and the instructor critique.
3. Suitability for presentation at the dental assistants' society meeting.
4. Overall success in presentation of material to individuals or groups.

REQUIREMENTS:

1. Use visual aids prepared in previous assignments, if applicable.
2. Devise methods of illustrating recommended treatments.
3. Select a sufficient number of radiographs showing pathology and anomalies for a full series.
4. Prepare a set-up for preventive oral hygiene.
5. Compose at least two copies of "printed" information for patient distribution.

RATIONALE:

1. The patient needs to understand recommendations in order to cooperate.
2. Showing as well as telling helps the patient understand what is expected to him or his family.
3. Terminology should be used which will be fully comprehended by the particular patient.

OUTCOME: The student will be aware of the patients' knowledge and comprehension, gain confidence in presenting the necessary information, develop skill in the preparation of visual aids/materials which may be used after employment, and become of increased value to both the dentist and the patient.

TASK: **Proper Telephone Techniques**

CRITERION: The student will be judged upon:

1. Tone of voice.
2. Method used in speaking into the transmitter.
3. Rate of speaking.
4. Replacing the transmitter in the cradle upon conclusion of the call.

REQUIREMENTS:

1. Voice evaluation by use of a tape recorder.
2. Demonstration in the proper handling of the transmitter.
3. Establish the terminology to be used in opening and closing conversations.
4. Student teams shall present unrehearsed problem-solving of unusual calls.

RATIONALE:

1. The first contact with a dental office is most frequently by telephone.
2. The manner in which the call is acknowledged often sets the basic relationship for the duration of the contact.

OUTCOME: The student will be able to:

1. Handle incoming and outgoing departmental calls.
2. Perform the receptionist's duties during Clinical Experience.
3. Handle the many types of calls received in the dental office.

TASK: **Utilization Of Life Sciences**

CRITERION: The student will be judged on his:

1. Ability to identify tooth tissues and structures on radiographs.
2. Ability to chart tooth surfaces with 100% accuracy.
3. Success in preventing the development of cultures on sterilized instruments and materials.
4. Proficiency in visual dictation of existing oral conditions.

REQUIREMENTS:

1. Drawings of the tissues of the teeth and their supporting structures.
2. Use a skull for identification of anatomy of the head.
3. Chart patients' dental needs as dictated.
4. Develop cultures, prepare slides and identify oral microorganisms.
5. Carry out sterilization techniques on all available equipment and establish aseptic condition of products.
6. Demonstrate the proper seating of a patient.
7. Student teams of three to rotate as dentist, dental assistant and patient for charting, taking oral specimen for cultures and instrumentation.

RATIONALE:

1. Understanding the relationship of General Anatomy and Dental Anatomy.
2. Knowledge of the structure and function of the teeth for charting types of needed restorations.
3. How to control and prevent transmission of microorganisms.
4. Application of Life Sciences to operative procedures.

OUTCOME: The student will be able to demonstrate his:

1. Comprehension of variations in oral conditions.
2. Legal accuracy in recording patient services.
3. Complete control of microorganisms.
4. Proficiency in chairside assisting.

TASK: **Classification Of Dental Materials**

CRITERION: The student will be judged on his ability to:

1. Mix dental cements within 15 seconds of the manufacturer's recommended time.
2. Pour casts completely free of porosity.
3. Prepare impression materials to produce an accurate and smooth reproduction.
4. Prepare accurately finished gold castings to the original die.
5. Produce the proper carving properties to the inserted silver alloy.

REQUIREMENTS:

1. Preparation of dental cements for restorations, luting, and bases.
2. Construct four sets of casts using different classifications of gypsum products.
3. Use casts and dies to prepare impression materials to make duplicates.
4. Using the instructor's designated material, take an impression of the student's own mouth for a study cast.
5. Prepare tooth restorative metals.
6. Demonstrate the use of chemicals and abrasives used in the operatory and laboratory.

RATIONALE:

1. The necessity for skill in preparing restorative materials at chairside.
2. Adapting appropriate materials to laboratory construction of dental prosthesis.
3. The ability to modify manipulations to meet unusual circumstances or techniques.

OUTCOME: The student will be able to prepare:

1. Tooth restorative materials properly to prevent breakdown or failure.
2. Impression materials to permit accurate duplication of gypsum products.

TASK: **Production Of Diagnostic Dental Radiographs**

CRITERION: The student will be judged on:

1. Complete accuracy in MA, KVP and exposure time for the individual situation.
2. Qualitative features of the film.
3. Processing techniques with no artifacts on film.
4. 100% identification on mounting and identification.

REQUIREMENTS:

1. Adjustment of equipment to specified technique.
2. Administer safety measures for patient and operator.
3. Prepare processing solutions as directed by manufacturer.
4. Expose film using specified technique on skull, fellow student, and out-patients. Time lapse between exposures to permit evaluaton.
5. Process and mount film.
6. Identification of anatomical landmarks.

RATIONALE:

1. Understand the function of the equipment and the biological effects of radiation.
2. Methods of reducing radiation hazards.
3. Importance of type film used and exposure technique.
4. The necessity for care of film during processing.
5. Diagnostic value by identification and mounting.

OUTCOME: The student will be able to:

1. Utilize all radiation protection measures.
2. Demonstrate precise processing techniques.
3. Produce qualitative diagnostic film.
4. Avoid the necessity of retaking film.

TASK: **Practice In Office Administration**

CRITERION: The student will be judged on the following procedures:

1. Young children appointed early in the day.
2. Correct number units of time for each appointment.
3. Critique of roll playing by class.
4. Accurate recording of patient fees and receipts according to the fee schedule.
5. Supply order to comply with the Supply Control Sheet.

REQUIREMENTS:

1. Prepare a four-week appointment schedule for the individuals listed on the assignment sheet.
2. Roll playing in greeting patients and reviewing needed dental services, greeting sales representatives or other persons as designated by the instructor.
3. Prepare and maintain Day Sheets for the patients on the appointment schedule with an accurate accounting of Petty Cash.
4. Complete three types of insurance forms and submit to the appropriate "company" for authorization.
5. Student teams will take an inventory of designated supply cabinets.
6. Make up a purchase order for necessary supplies.

RATIONALE:

1. The ethical and legal responsibilities of office personnel.
2. Human Relations: patient, para-dental, and professional.
3. Financial reports: patient and office expenses.
4. Insurance forms and regulations.
5. Maintaining an inventory and purchasing of supplies.

OUTCOME: The student will be able to apply these practices:

1. Office and patient information held in confidence.
2. Good patient and professional relationships.
3. An unhurried but productive appointment schedule.
4. Total response contributing to Practice Building Factors.

TASK: **The Ability To Measure Unknown Voltages**

CRITERION: Out of ten measurements, eight of the ten must agree to within 3% with the instructors pre-set value, and all measurements must be taken within a specified time period set by the instructor.

REQUIREMENTS:

1. Measurements shall be taken with a commercial VTVM or TVM (EICO 232 or equivalent).
2. The alloted time period should average no more than one minute per unknown voltage measurement to be taken.

RATIONALE:

1. Accurate voltage measurement is the key to swift and thorough analysis and troubleshooting of electrical and electronic systems, circuits, and components.
2. 3% accuracy is guaranteed by most commercial instruments.
3. The range of voltages specified is typical of those encountered in industrial situations, and is typical of the range of coverage of the above mentioned meters.

OUTCOME: The student shall be able to measure unknown voltages (both AC and DC) ranging from 0.1 volt to as high as 5000 volts.

TASK: **The Ability To Analyze Resistive Ladder Networks**

CRITERION: All results must be accurate to three significant figures, and obtained within a limited time period.

REQUIREMENTS:

1. Given a resistive ladder network of from four to seven "rungs".
2. Given an applied voltage, either AC or DC.
3. Student may use no computational aid other than a slide-rule.
4. Results must agree to at least the third significant figure with those of the instructor.
5. The problem must be solved within the time period allotted by the instructor, typically within a 50-minute class period, and preferably less.

RATIONALE:

1. The solution of complex circuits is essential to the survival of the technician on the job.
2. The solution of complex circuit problems in a classroom situation develops the students confidence in his ability to handle difficult problems on the job.
3. A network of less than four rungs is too simple (and a network of more than seven rungs is too tedious) to realistically evaluate the students ability to solve this type of problem.

OUTCOME: The student should be able to compute the total resistance RT, the total current IT, and the voltage across and the current through each resistor in a resistive ladder network.

TASK: **The Ability To Read The Resistor Color Code**

CRITERION: Absolute accuracy of at least 80% of all resistors read, within time limit established by the instructor.

REQUIREMENTS:

1. Given at least ten color-coded resistors of the composition axial type, ranging in value from 0.1 ohm to 99 megohms.
2. A time limit averaging no more than one minute per resistor to be read.

RATIONALE: The reading of resistor color codes occurs probably more frequently than any other on the job. The successful technician must be able to perform this task quickly, almost instinctively, and with absolute accuracy.

OUTCOME: The student should be able to determine from the colored bands on a resistor the ohmic resistance and percentage tolerance of the device.

TASK: **Understanding The Concept Of Magnetic Induction**

CRITERION:

1. Absolute accuracy of fundamental information.
2. Neatness of drawings to satisfaction of instructor.
3. A time limit of between five and ten minutes.

REQUIREMENTS: Given an illustration showing a permanent magnet (with its magnetic polarity indicated) in the proximity of an unmagnetized specimen of ferromagnetic material.

RATIONALE: The concept of magnetic induction is fundamental to the understanding of the operation of many electrical and electronic devices and systems, such as motors, generators, meter movements, inductors, transformers, etc.

OUTCOME: The student will:

1. Recognize the presence and direction of a magnetic field around the permanent magnet, and indicate same by correctly drawing magnetic field lines representing this field.
2. Draw field lines through the specimen showing concentration of the field within the specimen.
3. Recognize that internal molecular magnets of the specimen material are re-aligning themselves under the influence of the external field, and indicate same by drawing the alignment of one internal molecular magnet.
4. Determine from the alignment of the internal molecular magnets and label the magnetic polarity of the specimen.
5. Show the attractive force between the permanent magnet and the specimen using force vectors.

TASK: **The Ability To Apply Ohms Law To Find Current**

CRITERION: Results accurate to three significant figures, and completed within a period of time specified by instructor.

REQUIREMENTS:

1. Given a simple AC or DC circuit including a power supply, pre-set to a particular voltage, connected to a resistor.
2. Computations involved shall be performed with the aid of the slide rule.
3. Time allowed for this type of problem shall not exceed five minutes.

RATIONALE: Ohms Law is the technicians only available tool for predicting the electrical behavior of a network or circuit.

OUTCOME: The student should be able to determine the current that will flow in a simple electrical circuit.

TASK: **The Ability To Apply Ohms Law To Find Resistance**

CRITERION: Results within slide rule agreement of those of instructor, within a specified time limit.

REQUIREMENTS:

1. Given a specified applied voltage connected to a complex resistive network, connected thru a current meter.
2. Student shall determine R_T from the power supply's viewpoint, using Ohms Law.
3. Time limit shall not exceed three minutes.

RATIONALE:

1. The ability to determine the total resistance of a complex resistive network is a frequently required task of the technician.
2. The short time limit forces the student to use the quickest and easiest method available to him, an obvious necessity to any successful technician.

OUTCOME: The student should be able to determine the total resistance R_T of a complex resistive network using simple applications of Ohms Law.

TASK: **The Ability To Apply Ohms Law To Find Voltage**

CRITERION: Results in agreement with instructors to three significant figures, within a limited time period.

REQUIREMENTS:
1. Some unknown voltage applied to a properly color-coded resistor.
2. Some means of measuring circuit current (a milliammeter).
3. Slide rule provided by student.
4. A time limit of no more than three minutes.

RATIONALE: The technician frequently must use this approach to find an unknown circuit voltage.

OUTCOME: The student should be able to determine the magnitude of an unknown voltage applied to a simple resistive circuit.

TASK: **The Ability To Analyze Basic Series Circuits**

CRITERION: All results in agreement with instructors to three significant figures within the time period specified.

REQUIREMENTS:
1. A series string of resistors (3 - 5) whose color-coded values are correct.
2. Some given applied voltage (AC or DC).
3. Slide rule, engineering paper and pencil.
4. Time limit of from fifteen to twenty-five minutes.

RATIONALE: The understanding of and the ability to analyze a series circuit is fundamental to the analysis of more complex circuits, both resistive and reactive.

OUTCOME: The student shall be able to:
1. Determine R_T of a simple series circuit.
2. Calculate I_T, and specify that this current is the same throughout the circuit.
3. Compute the voltage drop which appears across each resistor in the series string.
4. Check his results by adding up all voltage drops and comparing to the applied voltage.

TASK: **The Ability To Analyze Basic Parallel Circuits**

CRITERION: All results in agreement with instructors to three significant figures within time period specified.

REQUIREMENTS:

1. A parallel bank of resistors (3 - 5) whose color-coded values are correct.
2. Some given applied voltage (AC or DC).
3. Slide rule, engineering paper and pencil, all supplied by student.
4. Time limit of from fifteen to twenty minutes.

RATIONALE: The ability to analyze simple parallel networks is fundamental to the solution of more complex resistive and reactive networks.

OUTCOME: The student shall be able to:

1. Determine R_T of a simple parallel circuit.
2. Calculate I_T for the entire network.
3. Recognize and state the fact that the voltage across each branch of the network is the applied voltage.
4. Calculate the current in each branch.
5. Check his results by summing the individual branch currents and comparing with I_T.

TASK: **The Ability To Analyze Series RCL Circuits**

CRITERION: All values of X, Z, I, and E must be within agreement of the values obrained by the instructor to three significant figures. Angular measurements must agree to within 2 degrees. Problem solution shall be accomplished within specified time period.

REQUIREMENTS:

1. Given a series RCL circuit, with all component values specified.
2. Given the magnitude and frequency of an applied AC voltage.
3. Slide rule, engineering paper, pencil, eraser, straight-edge, protractor, all supplied by student.
4. Time limit of thirty minutes.

RATIONALE: The series RCL circuit is one of the two fundamental types of reactive networks, and its solution is basic to the solution of more complex reactive networks.

OUTCOME: The student must be able to:

1. Calculate the reactance of the C & L component of the circuit.
2. Determine Z graphically, by vectorially combining R, X_C, and X_L.
3. Specify the exact phase angle (in degrees) and its sign (+ or -).
4. Calculate the total current I_T, and its phase angle relative to the applied voltage.
5. Calculate the voltage drop across the R, C, and L component, and specify the phase angle for each.
6. Draw the voltage vector diagram of the circuit.

TASK:	**Fabricate Electronic Gear From Schematics And Verbal Instructions**
CRITERION:	The training will be judged successful when the student can completely fabricate and finish a piece of electronic gear which shows pride in workmanship in every detail and has been fabricated using materials and techniques current in the electronics industry, as judged by the instructor.
REQUIREMENTS:	The student will be expected to develop complete drawings, parts list, printed circuit board, and a completely finished sheet metal chassis appropriate to the product being fabricated. The finished product shall be evidence of over-all good planning. The circuitry shall be readily accessible for aligning and troubleshooting. Location of parts, built-in safety devices, front panel marking, and accessibility of controls shall conform to accepted industrial methods.
RATIONALE:	The electronics technician may often be required to fabricate electronic gear from schematics and drawings or verbal instructions. This may require skills in drafting, sheet metal working, metal finishing and graphic arts.
OUTCOME:	Upon completion of this objective, the student will be able to fabricate electronic prototype models from drawings or verbal instructions.

TASK: **Troubleshoot And Repair Electronic And Electrical Equipment**

CRITERION: The training will be judged successful when the student is able to proficiently, as judged by the instructor, apply principles of logical troubleshooting to determine and repair malfunctions in electronic systems common in the laboratory electronics vocation.

REQUIREMENTS: The student will be expected to demonstrate logical troubleshooting techniques on at least five different common electronic systems. The malfunctions shall be identified and removed in a professional manner. Evaluation of the students performance on each troubleshooting problem will include the ability to select and apply test instruments and hand tools, and the ability to interpret schematic diagrams, instructions and instrument displays.

RATIONALE: Because of the complexity of much of todays electronic equipment, the electronic technician should be well trained in logical troubleshooting to reduce time and part changes to a minimum.

OUTCOME: The student will be able to troubleshoot and repair electronic and electrical equipment, including metering devices, testing and inspection devices, manufacturing equipment, experimental and prototype models, and communications equipment.

TASK: **Reading Electronic Schematics**

CRITERION: The training will be judged successful when the student can:

1. Identify all common electronic components and their symbols.
2. Draw block diagrams of electronic systems from schematic diagrams.
3. Explain the function of the various components and their relationship to specific circuits.
4. Trace the signal flow and direct current paths in circuits.
5. Use the additional printed information on the schematics in testing, troubleshooting, aligning, and calibrating electronic circuits.
6. Draw the schematic diagram of electronic systems using popular format of the electronics industry.

REQUIREMENTS: The student will be required to demonstrate the ability to read schematic diagrams by using them to test, troubleshoot, align and calibrate at least four different electronic systems. In addition the student shall trace an actual circuit for which no schematic is available and draw a diagram using popular industrial format.

RATIONALE: A schematic diagram shows the functions and relations of the component devices of a circuit by means of graphical symbols. Such a diagram makes it possible for a person schooled in electronics to trace a circuit with comparative ease. The ability to read schematic diagrams is essential in the design, modification and troubleshooting of electronic circuits.

OUTCOME: Upon completion of this objective the student will be able to proficiently read a schematic diagram to aid in modifying, aligning, calibrating, testing and troubleshooting electronic circuits.

TASK: **Use Small Hand Tools**

CRITERION: The training will be judged successful when the student can, in the judgement of the instructor:

1. Select the best available tool for a required operation.
2. Adjust, sharpen, and maintain all required tools.
3. Observe proper safety habits in using each specific tool effectively.

REQUIREMENTS: The student will be expected to demonstrate proficiency in the above named criteria by completely fabricating two electronic products. Both products must include:

1. A printed circuit board.
2. A metal chassis with appropriate finish, labels and markings.
3. A chassis assembly drawing and schematic diagram.

In addition, the student shall demonstrate sharpening and maintenance, as applicable, of all tools involved in producing the two products.

RATIONALE: The electronics technician is a craftsman who, to fulfill his job in electronics, may be required to operate tools and equipment for electronics, drafting, sheet metal working, machine shop and graphic arts. This requires the ability to proficiently use a broad variety of hand tools and machines in electronics construction techniques and maintenance.

OUTCOME: Upon completion of this objective the student will be able to select the appropriate tools for a job, set them up properly, and use them effectively to solve problems in electronics construction and maintenance.

TASK: **Check Electronic Components**

CRITERION: The training will be judged successful when the learner can identify the five basic component parts of electronics and select and apply appropriate test instruments to determine and record their electrical characteristics. The resulting data shall be similar to the published specifications, taking component tolerances and instrument accuracy into consideration.

REQUIREMENTS: The student shall demonstrate proficiency in checking electronic components with the accuracy of the check being limited only by the accuracy of the test instrument. The learner will be required to measure:

1. The DC resistance, inductance and Q of four coils using a VOM and an impedance bridge.
2. The capacitance and D of four capacitors on the impedance bridge and the capacitance and leakage test of four more capacitors on the capacitance bridge.
3. The resistance of three sets of four resistors on the VOM, VTVM and impedance bridge.
4. The leakage current I_{CEO} and I_{CBO} of two transistors, also the current gain of two transistors.
5. The forward to reverse resistance ratio of four diodes.
6. The mutual conductance of four vacuum tubes and also determine if the tubes have shorts or are gassy.

RATIONALE: The basic component parts for all electronic apparatus may be classified as follows: resistors, capacitors, coils, vacuum tubes, and semiconductor devices. The ability to check electronic components is vital to ascertain normal operation and to isolate or analyze failure.

OUTCOME: Upon completion of this objective, the learner will be able to select appropriate instruments and measure:

1. AC and DC resistance of resistors.
2. Inductance and Q of coils.
3. Capacitance and D of capacitors.
4. Mutual conductance and emission of vacuum tubes.
5. Leakage current and current gain of semiconductor devices.

TASK: Interpret And Record Test Data

CRITERION: The learner will be required to maintain a laboratory notebook with entrys for each laboratory problem. One report from the notebook will be selected by the instructor. This report will be given to another learner who will be required to construct the complete laboratory problem without the aid of other references.

REQUIREMENTS: The methods of modern industry will be emulated as directly as possible. That is, a laboratory notebook shall be maintained by each learner. The notebook shall contain theory, calculations, schematic diagrams, data and graphs, as appropriate, for each specific laboratory problem. The notebook shall contain enough information so that the work could be completely reconstructed at a future time by a different electronics technician.

RATIONALE: On the job an electronics technician may be required to record data and then organize and display the data in a report. This requires communication skills which should be developed during the learners formal training.

OUTCOME: Upon completion of this objective the learner will be able to:

1. Take data.
2. Organize and correlate the data so that conclusions can be deduced.
3. Display the data on graphs.
4. Present a coherent and readable report.

TASK: Calibrate Test Equipment

CRITERION: Given a "standard" to use as a comparison and given the required maintenance manuals, the learner will promptly and proficiently calibrate the assigned instruments. The training will be judged successful when the learner can select and complete the appropriate calibration procedure in a reasonable time, as judged by the instructor.

REQUIREMENTS: The learner will be required to:

1. Determine if the given instruments need calibration.
2. Select appropriate manuals and test equipment.
3. Calibrate a VTVM, oscilloscope, frequency meter, signal generator, and digital voltmeter.

RATIONALE: To maintain quality measurements, it is customary in the electronics industry to compare measuring instruments with a standard at regular intervals to determine and re-adjust their accuracy. For some instruments this could mean calibration once each year, other instruments may require calibration every ninety days. The laboratory electronics technician may be required to calibrate test equipment.

OUTCOME: Upon completion of this objective the learner will be able to calibrate common laboratory electronic test equipment.

TASK: **Specify And Order Electronic Components**

CRITERION: In selecting components, the learner will be judged by the instructor on the suitability of the component considering: maximum ratings, quality, physical size, price, acceptable substitute, and application.

REQUIREMENTS: Given schematic diagrams of two different electronic circuits or systems and necessary catalogs, the learner will be required to write two complete purchase orders for all components on the diagrams. The purchase orders must be clearly understandable to any other electronics technician and the component selection must be judged acceptable by the instructor.

RATIONALE: The electronics technician will frequently be required to obtain components for prototype construction or as replacement parts.

OUTCOME: Upon completion of this objective the learner will be able to select and order appropriate electronic components to fill specific circuit requirements.

TASK: Apply First Aid

CRITERION: The training will be judged successful when the learner:

1. Given each simulated accident which could happen in the electronics laboratory, can begin first aid promptly, following procedures explained in the "Red Cross First Aid Handbook".
2. Can demonstrate correct safety practices in using tools, equipment and moving heavy objects.

REQUIREMENTS: The learner will be required to:

1. Pass an electronics safety examination with a score of 100%.
2. Demonstrate first aid for a shock victim, including mouth-to-mouth resuscitation on a dummy.
3. Demonstrate correct use of all tools and equipment found in the electronics laboratory.
4. Demonstrate safe techniques of moving heavy objects.
5. Describe first aid for foreign material in eyes and cuts and punctures.

RATIONALE: An adequately trained electronics technician is well aware that the job involves certain hazards. The most serious hazards would probably be that of electric shock and improper use of tools and equipment. The technician should be taught the dangers of the trade before exposure to these dangers and logically first aid instruction should also be given.

OUTCOME: The learner will be able to administer appropriate first aid for every type of accident which could be expected to happen in the electronics laboratory if general trade safety were ignored.

TASK: **Maintain An Organized Work Area**

CRITERION: The training will be judged successful when the learner has demonstrated consistently good habits in maintaining an organized work area over a period of 18 weeks, as judged by the instructor.

REQUIREMENTS: The learner will be required to set up instruments and test circuits in an organized manner for each lab problem. Circuitry will be layed-out so that it can be easily traced and all unnecessary wires and terminals will be eliminated. Upon completion of each work period, the learner will return all instruments, tools, components, reference books and diagrams to their assigned spots. All trash will be removed and the work area swept clean. The learner shall draw a sketch of the work area showing the location of the work benches, power facilities, filing cabinets, reference books, tool panel, parts storage, light switches and the thermostat:

RATIONALE: Good work habits are essential in the long term successful application of technical skills. Effective organization of the facilities and instrumentation may contribute just as much to success as adequate technical skills.

OUTCOME: Upon successful completion of this objective, the learner will be able to maintain an organized work area, which will include:

1. Effective use of existing space for equipment, record keeping and parts storage.
2. Correct voltage selection and safety precautions.
3. Adequate illumination and environmental control.

TASK: **To Train Students As Employable Park Technicians**

CRITERION: The ability to obtain and hold a job as a park technician.

REQUIREMENTS:

1. Pass FEEE or state test given by civil service.
2. Be 18 years of age or over.
3. Understand the park function.
4. Understand technical terms.
5. Be able to solve problems of resource management.
6. Be able to work with the public.
7. Be able to speak formally or informally.
8. Be able to use tools.
9. Be able to work with others.

RATIONALE:

1. Increased public use of park facilities has created a need for park personnel.
2. Park Technicians occupy a position between semi-skilled and professional park managers.
3. Workers in public parks must be able to work with the public.
4. Being able to work with others is highly desirable in any service agency.

OUTCOME: The student will be able to function as a park technician.

TASK: **To Participate In The Management Of Park Resources Under Working Conditions**

CRITERION: Performance in a working situation.

REQUIREMENTS:

1. Understand how to protect and measure resources.
2. Ability to use the tools helpful in protecting and measuring resources.
3. Ability to solve related mathematical problems.
4. Understand resource ecosystem.
5. Pass individual subject tests.

RATIONALE: Understanding and having a working knowledge of resource management assists park managers in keeping the resource in it's planned condition.

OUTCOME: The student will be employable in the area of park resource management.

TASK: **Ability To Present Resource To Visitor**

CRITERION: Ability to use knowledge under varying conditions.

REQUIREMENTS:

1. Identify plants and animals.
2. Knowledge of plants and animals and how they affect one another.
3. Knowledge of the geology and history of the area.
4. Present knowledge individually or to groups.
5. Use and care of audio-visual equipment.
6. Application of knowledge during summer employment.

RATIONALE:

1. Visitor interest in and concern for a park resource increases as he is informed.
2. Visitors have a natural curiosity about the resource.
3. Duty of managing agency is to provide information to the visitor in addition to what he can interpret for himself.
4. Park technicians provide a personal and formal contact with the visitor and are able to provide additional information of interest to the visitor.

OUTCOME: The student will be able to present and explain the resource to the public.

TASK: **To Provide Visitor Comfort, Protection, And A Sense Of Well-Being**

CRITERION: The ability to apply his knowledge under working conditions.

REQUIREMENTS:

1. Provide emergency first aid to visitor.
2. Protect visitor from the hazards of the resource.
3. Protect visitors from each other.
4. Be able to give directions and instructions.
5. Be able to record statistical visitor information.
6. Be able to handle money honestly.
7. Ability to work with public.
8. Ability to work with others.

RATIONALE:

1. Managing agency is responsible for the safety of the visitor.
2. Park revenue comes partly from visitor payments.
3. The resource is able to absorb a limited number of visitors.
4. Park technicians provide personal and formal contact with public.

OUTCOME: The student will be able to aid and protect the visitor and to provide managers with statistical visitor information.

TASK: **The Ability To Interpret The Resource To The Visitor**

CRITERION: Ability to identify components of resource

REQUIREMENTS:
1. Identify plants and animals.
2. Identify geologic formations.
3. Identify historical significance.
4. Ability to interrelate resource components.
5. Ability to present knowledge formally and informally.

RATIONALE:
1. Visitors have a natural curiosity about individual resource components.
2. Visitors enjoy resource more if they can identify resource components.
3. Park technicians must be able to identify resource components in order to explain the resource to others.

OUTCOME: The student will be able to interpret resource.

TASK: **To Train Student In Plant Identification**

CRITERION: Identify specific plant specimens.

REQUIREMENTS:
1. Ability to use plant keys.
2. Ability to recognize broad plant groups.
3. Know where to look for identification keys.
4. Ability to identify plant parts.
5. Identify 7 out of 10 plants, both specimens and in the field within a time set by instructor.

RATIONALE:
1. Ability to identify and recognize plants is one key to understanding the resource.
2. One must understand the resource to explain it.
3. Visitors ask specific questions about resource plants.

OUTCOME: The student will be able to identify the plants of the area.

TASK: **To Train Students In Animal Identification**

CRITERION: Identify specific animal specimens.

REQUIREMENTS:

1. Quick recall of animal groups.
2. Ability to use field guides.
3. Ability to identify animal parts.
4. Ability to identify animals by tracks or calls.
5. Ability to identify where specific animals are likely to be found.
6. Identify 7 out of 10 animals, either with skins or in the field within time limit set by instructor.

RATIONALE:

1. Ability to recognize and identify animals is a key to understanding the resource.
2. Visitors ask questions about the identity of animals.
3. One must be able to understand the resource to explain it.

OUTCOME: The student will be able to identify animals of the area, both in the field and by museum skins.

TASK: **To Recognize The Major Animal Groups**

CRITERION: The ability to identify specific animals in major groups.

REQUIREMENTS:

1. Quick recall of groups.
2. Ability to identify differences in animal parts.
3. Knowledge of group characteristics.
4. Identify all major animal groups found in the area.
5. Identify 7 out of 10 animals as to their major groups.

RATIONALE:

1. Identification of major animal groups is the key to animal identification.
2. Visitors have knowledge of several animal groups.

OUTCOME: The student will be able to recognize major animal groups common to the area.

TASK: **To Protect Resource From Fire, Weather, Animals, Pollution And Visitors**

CRITERION: Perform under working conditions

REQUIREMENTS:

1. Knowledge of fire suppression
2. Knowledge of insect control and when to use it.
3. Ability to use fire suppression and insect control tools.
4. Ability to maintain tools and equipment.
5. Ability to recognize environmental hazzards to visitors.
6. Ability to work individually or with others.

RATIONALE:

1. Fire is an ever present danger to the resource.
2. Most fires are started by humans.
3. Fire fighting tools must always be ready.
4. Insect damage becomes critical to resource when population of insects are higher and resource is in an unbalanced condition.

OUTCOME: The student will be able to apply the proper skills necessary to protect the resource.

TASK: **The Ability To Work On a Fire Fighting Crew**

CRITERION: Demonstrate the use and maintenance of fire suppression tools and equipment under varying conditions.

REQUIREMENTS:

1. Knowledge of fire suppression.
2. Knowledge of fire behavior.
3. Knowledge of firefighting tools and equipment.
4. Ability to use tools and equipment
5. Ability to maintain tools and equipment
6. Accountability of tools and equipment

RATIONALE:

1. Fire occurs in all park resource areas.
2. Fire may damage personal property or life.
3. Park managers are responsible for safety of park visitors and their personal property.

OUTCOME: The student will be able to function as a valuable member of a firefighting crew.

TASK: **The Ability To Make Depth Measurements With The Depth Micrometer**

CRITERION: Eight out of ten depth measurements made with the depth micrometer must agree with the instructors measurement.

REQUIREMENTS: All depth measurements are to be made with a depth micrometer.

RATIONALE: The depth of key-ways, slots, and grooves can be accurately measured with the depth micrometer.

OUTCOME: The student will be able to make accurate depth measurements with the depth micrometer.

TASK: **The Ability To Set Up And Interpret The Readings Of A Dial Indicator**

CRITERION: The dial indicator will be used for concentric alignment of internal and external surfaces in the lathe four jaw chuck. It will be used to align a swivel vise on a milling machine, and to align the vise on a shaper.

REQUIREMENTS: Alignment shall be with the standard dial indicator and standard attachments for internal use.

RATIONALE: Bars and machined pieces must be aligned in the lathe for secondary operations and vises must be aligned on both the shaper and milling machine.

OUTCOME: The student will be able to set up the dial indicator on lathes, mills, shapers, and other machine tools and interpret the readings.

TASK: **The Ability To Make Measurements With The Inside Micrometer**

CRITERION: Out of ten inside measurements eight of the ten must agree with the instructor's measurements.

REQUIREMENTS: The student will be assigned ten machined parts to measure ranging from 1 inch, to 12 inches.

RATIONALE: A machinist is required to machine holes with accuracy and must be able to use the inside micrometer to measure his work.

OUTCOME: The student will be able to make accurate measurements with the inside micrometer.

TASK: **The Ability To Make Measurements With The Vernier Caliper**

CRITERION: Out of ten each inside, outside, and depth measurements the students measurements must agree within + or - .001 inch with the instructors measurements.

REQUIREMENTS: Measurements will be made with the knife vernier caliper capable of an accuracy of .001 inch.

RATIONALE: The vernier caliper is a very useful precision measuring instrument where the required accuracy does not exceed + or - .001.

OUTCOME: The student will be able to make accurate inside, outside, and depth measurements with the vernier caliper.

TASK: **The Ability To Bore Metal In A Lathe**

CRITERION: The hole must be bored to the size specified by the instructor and within the tolerences given. The hole must be of the correct depth and can not have any measurable taper.

REQUIREMENTS: All measurements will be made with precision measuring instruments and within the allotted time.

RATIONALE: A machinist must be able to bore holes of diameters other than those of common drills, or of greater accuracy than can be obtained with drills.

OUTCOME: The student will be able to bore materials on a lathe with a boring bar.

TASK: **The Ability To Take Accurate Measurements With The Outside Micrometer**

CRITERION: Out of ten measurements assigned, eight of the ten must agree with the instructor's measurement.

REQUIREMENTS: The student will be given ten items to measure using 1 inch, 2 inch, and 3 inch micrometers.

RATIONALE: In order to machine parts accurately a machinist must be able to measure accurately with the outside micrometer.

OUTCOME: The student will be able to make accurate measurements of machined parts using the outside micrometer.

TASK: **The Ability To Turn Metal In A Lathe**

CRITERION: The diameter of the work, must be within the tolerances specified by the instructor and there can be no measurable taper for the length of the cut. Finish must meet the instructors requirements.

REQUIREMENTS: The student will be assigned a turning project and provided with tool bit, lathe, and necessary accessories. The work must be completed in an allotted time.

RATIONALE: The most common work performed in a lathe is the turning of outside diameters.

OUTCOME: The student will be able to turn metal in a lathe to a specified dimension.

TASK: **The Ability To Face Metal In A Lathe**

CRITERION: The faced surface must be machined flat and not convex or concave and must not have a tit left at the center of the object. The finish must meet the instructors requirements.

REQUIREMENTS: Three methods shall be used in the facing operation: free plate, check, and between centers.

RATIONALE: The facing operation is one of the three most important performed in the lathe.

OUTCOME: The student will be able to face metal in a lathe.

TASK: **The Ability To Operate A Lathe**

CRITERION: The machine finish and the accuracy of the machined part to a pre-set dimension must fall within the limits set by the instructor.

REQUIREMENTS:
1. The finish of the work shall meet industrial specifications.
2. All measurements shall be taken with precision measuring instruments.

RATIONALE: The most common machine tool in industry is the lathe, or a variation of the lathe; thus a machinist must be able to operate one.

OUTCOME: The student shall be able to perform turning, facing, boring and related operations on a lathe.

TASK: **The Ability To Grind A Lathe Tool Bit**

CRITERION: The finished tool bit must meet within 1 degree, the required angles specified for shape, clearance and rate, and must meet finish requirements.

REQUIREMENTS:
1. All grinding will be done off-hand on a bench grinder.
2. All angle measurements will be taken with a level protractor or comparitor.

RATIONALE: In order for a tool bit to machine material in a lathe properly, it must have the required angles and finish.

OUTCOME: The student will be able to grind lathe tool bits for facing, turning, and boring different materials, such as metal, aluminum, brass, etc.

TASK: **Ability To Letter With A Mechanical Device**

CRITERION: The student is successful when, in the judgement of the instructor, two drawings have been lettered with the neatness and accuracy required in professional work and with sufficient clarity to be read after photographic reduction.

REQUIREMENT: The student will be required to completely letter with ink one drawing with the Wrico and one with the Leroy.

RATIONALE: Since freehand lettering may not be acceptable on all industrial drawings, skill in the use of lettering devices is essential for the well prepared draftsman.

OUTCOME: The student will be able to letter satisfactorily with a device such as the Wrico or Leroy instruments.

TASK: **The Ability To Make An Orthographic Drawing Layout**

CRITERION: The student will be required, when given a pictorial of a machine assembly, to successfully lay out at an appropriate scale a simple orthographic drawing with three principle views, an orthographic drawing with two or three principle views plus partial auxiliary, and an orthographic drawing of at least two principle views, plus partial auxiliary or other partial view, and a chart as a parts list.

REQUIREMENTS: The student will have succeeded when, in the instructors opinion, the above listed requirements compares favorably with professional drawings of similar nature and complexity.

RATIONALE: Industrial drawings present graphical information in a logical manner through use of established projection methods, and verbal information in note or chart form. The selection of the proper views, scale, and charts will be major factors in producing a successful sheet.

OUTCOME: The student should be able to select the proper scale and the necessary orthographic views to completely describe an object, and to select logical positions on the drawing for charts and notes.

TASK: **The Ability To Make An Isometric Drawing**

CRITERION: The student will be required to make four isometric drawings, using sectioning, dimensioning, circles, arcs, and non-isometric lines at least once in the four drawings. One isometric assembly drawing will involve sectioning and one exploded assembly drawing will include isometric lettering.

REQUIREMENTS: The student will have succeeded when in the opinion of the instructor, he can produce the required drawings so that they compare favorably with professional drawings of similar complexity.

RATIONALE: Isometric drawing is a pictorial form much used by industry. and this skill is a job placement requirement for many draftsmen. Isometric sketching is required of all draftsmen.

OUTCOME: The student will be able to make isometric drawings which include isometric lines, non-isometric lines, circles, arcs, dimensions, and sections.

TASK: **The Ability To Operate A White Print Reproduction Machine**

CRITERION: The student will be required to reproduce four drawings, one sepia intermediate, and a second generation print from the sepia. He will also be required to pass a written quiz on the functions and servicing of the machine.

REQUIREMENTS: The student will have succeeded when the prints and sepia are judged by the instructor to be satisfactory and the written quiz has been completed with a minimum score of 75%.

RATIONALE: A draftsman on the job may be required to operate a reproduction machine or to supervise another so engaged.

OUTCOME: The student should be able to operate a standard, continuous printing, ammonia developed, white print, duplicating machine in a satisfactory manner.

TASK: **The Ability To Make Composite Drawings (Scissors Drafting)**

CRITERION: The student will be given an intermediate of a machine assembly drawing. He will cut out or eradicate unwanted portions, redraft and reletter in accordance with design changes scheduled for the assembly.

REQUIREMENTS: The instructor will judge the student to have succeeded when an intermediate made from the composite presents the intended revised graphical and verbal information clearly and without excessive indication of patching.

RATIONALE: Drafting departments save much time and money by this "scissors drafting" procedure. Draftsmen capable of using the process have more job opportunities.

OUTCOME: The student will be able to make composite drawings by combining portions of intermediates, redrafting, and then making a new intermediate.

TASK: **To Make Sheet Metal Developments By Parallel Line, Radial, Or Triangulation Methods**

CRITERION: The student will be required to develop two patterns each by the parallel line, radial, and the triangulation methods. He will be given a written or oral quiz to determine his ability to select the proper method of development.

REQUIREMENTS: The student will be judged successful by the instructor when paper patterns cut from his stretch-outs form up properly to the original orthographic views. The quiz must be passed with a minimum score of 75%.

RATIONALE: Although many devices exist to aid a sheet metal worker develop patterns, these are not always available. It is often necessary for draftsmen to draw sheet metal patterns.

OUTCOME: The student will be able to make sheet metal developments, and to determine the proper method which should be used to develop a pattern with a given characteristic.

TASK: **To Make Plan-Profile-Section Drawings**

CRITERION: The student will be given a topographic map with three specified points and/or compass bearings along which plan and profile drawings are to be drawn. One cross section will also be required.

REQUIREMENTS: Student performance will be judged as successful by the instructor when a check of three points on each profile line, two points of the section, and a check of lengths and the compass bearings indicated on the plan show accurate graphic placement. Lettering and linework must compare favorably with similar professional work.

RATIONALE: Plan-profile-cross section engineering drawings are used with sufficient frequency to indicate that a general draftsman should be capable of drawing them.

OUTCOME: The student will be able to make plan-profile-section drawings of the type needed for a street or sewer development.

TASK: **To Make Sectioned Orthographic Drawings**

CRITERION: The student will be required to make from pictorial drawings an orthographic detail drawing with a full sectioned detail drawing and intermittent portions, a detail drawing with broken out section using a cutting plane line, and a simple assembly drawing, half sectioned, with revolved and removed portions, and non-sectioned interior parts. These three drawings should include at least five different materials requiring section symbols.

REQUIREMENTS: The student will have succeeded when, in the opinion of the instructor, these three drawings compare favorably with professional drawings of similar nature and complexity.

RATIONALE: Section drawings are an efficient means of describing the shape of interior features and materials. The standard conventions associated with this type of drawing must be familiar to the draftsman.

OUTCOME: The student will become able to draw sectioned orthographic mechanical drawings, both detail and assembly.

TASK: **To Develop A Bill of Materials And/Or Parts List**

CRITERION: At least four assembly or weldment drawings will be assigned requiring parts lists or bills of materials. Included will be listings of parts already manufactured as castings or parts machined from stock, listings of raw stock sizes such as bar stock, tube, and structural shapes, and purchased parts such as keys and threaded fasteners.

REQUIREMENTS: Favorable comparison with similar lists on commercial drawings and the passing of a quiz with a score of at least 75% will indicate the required proficiency. This rating will be done by the instructor.

RATIONALE: A beginning mechanical draftsman must be familiar with callout procedure, and he should be able to develop materials and parts lists.

OUTCOME: The student will become able to develop a bill of materials and/or a parts list.

TASK: **To Draw A Pictorial Piping Drawing**

CRITERION: The student will be instructed to draw isometric containers, lines of liquid flow, and with schematic symbols, indicate the fittings used. A quiz will be given to determine the mastery of 20 screwed pipe symbols.

REQUIREMENTS: The student will be judged successful by the instructor when the isometric portion of the drawing and the piping symbols used are correct. Minimum grade on the quiz to indicate successful learning of the symbols is 75%.

RATIONALE: Piping is in common use and often needs to be indicated in technical drawings. Graphic schematic pictorial representation contributes to the clarity of the directions given.

OUTCOME: The student should be able to draw simple schematic pictorial piping drawings.

TASK: **To Visualize Data**

CRITERION: The training was judged successful when each participant had developed to a level of achievement within the estimated lecture/laboratory learning time. Students were required to pass examinations to measure each level of achievement with a minimum score of 75% correct.

REQUIREMENTS: Adequate lecture and laboratory facilities for the learner/performer to achieve the levels were provided. Sketches, diagrams, blueprints, and verbal information of mechanical, electrical, fluid, and heat systems were given. Each participant supplied his own paper, pen or pencil, books, and supplies, and visualized, drew, sketched, or wrote information as required by the instructor.

RATIONALE: Without knowledge, comprehension, and applications in the area to the indicated level, the participant will lack skills necessary to obtain a position and advance in his position at a satisfactory rate. With the growing complexity of technology and the high level of expenditure for research and development the well-trained participant will be in continued demand in the future. The mechanical technician must have an insight into designs and systems. This can only be gained by practice.

OUTCOME: Each participant is able to visualize data of mechanical, electrical, magnetic fluid, and heat system.

TASK: **To Design A System**

CRITERION: The training was judged successful when each participant had developed to a level of achievement within the estimated lecture/laboratory learning time. Students were required to pass examinations to measure each level of achievement with a minimum score of 75% correct.

REQUIREMENTS: Adequate lecture and laboratory facilities for the learner/performer to achieve the levels were provided. Each participant supplied his own paper, pen or pencil, books, and supplies as required. Each participant was given specifications of a system and made a set of working drawings, written report, model, and oral presentation.

RATIONALE: Without knowledge, comprehension, and applications in the area to the indicated level, the participant will lack skills necessary to obtain a position and advance in his position at a satisfactory rate. With the growing complexity of technology and the high level of expenditure for research and development the well-trained participant will be in continued demand in the future. Designing a system helps the mechanical technician to understand the problems involved in these areas.

OUTCOME: Each participant is able to design a mechanical only system, the machines and tools, metal products, and devices.

TASK: **To Produce A System**

CRITERION: The training was judged successful when each participant had developed to a level of achievement within the estimated lecture/laboratory learning time. Examinations to measure each level of achievement were taken. The learner/performer receiving a minimum overall score of 75% correct was rated satisfactory.

REQUIREMENTS: Adequate lecture and laboratory facilities for the learner/performer to achieve the levels were provided. Each participant supplied his own paper, pen or pencil, books, and supplies as required. Each participant was given a set of working drawings and instructions, and made parts.

RATIONALE: Without knowledge, comprehension, and applications in the area to the indicated level, the participant will lack skills necessary to obtain a position and advance in his position at a satisfactory rate. With the growing complexity of technology and the high level of expenditure for research and development the well-trained participant will be in continued demand in the future.

OUTCOME: Each participant is able to produce a mechanical only system, the machines and tools, metal products, and devices

TASK: **To Install A System**

CRITERION: The training was judged successful when each participant had developed to a level of achievement within the estimated lecture/laboratory learning time. Examinations to measure each level of achievement were given. A minimum score of 75% was considered as satisfactory.

REQUIREMENTS: Adequate lecture and laboratory facilities for the learner/performer to achieve the levels were provided. Each participant supplied his own paper, pen or pencil, books, and supplies as required. Parts and instructions were given and installed according to directions.

RATIONALE: Without knowledge, comprehension, and applications in the area to the indicated level, the participant will lack the skills necessary to obtain a position and advance in his position at a satisfactory rate. With the growing complexity of technology and the high level of expenditure for research and development the well-trained participant will be in continued demand in the future. Putting a system together with only the instructions and parts gives the mechanical technician valuable experience under working conditions.

OUTCOME: Each participant is able to install a mechanical, electrical, magnetic, fluid, and heat system.

TASK: **To Install A System**

CRITERION: The training was judged successful when each participant had developed to a level of achievement within the estimated lecture/laboratory learning time. Examinations to measure each level of achievement were given. A minimum score of 75% was considered as satisfactory.

REQUIREMENTS: Adequate lecture and laboratory facilities for the learner/performer to achieve the levels were provided. Each participant supplied his own paper, pen or pencil, books, and supplies as required. Parts and instructions were given and installed according to directions.

RATIONALE: Without knowledge, comprehension, and applications in the area to the indicated level, the participant will lack the skills necessary to obtain a position and advance in his position at a satisfactory rate. With the growing complexity of technology and the high level of expenditure for research and development the well-trained participant will be in continued demand in the future. Putting a system together with only the instructions and parts gives the mechanical technician valuable experience under working conditions.

OUTCOME: Each participant is able to install a mechanical, electrical, magnetic, fluid, and heat system.

TASK: **To Operate A System**

CRITERION: The training was judged successful when each participant had developed to a level of achievement within the estimated lecture/laboratory learning time. Examinations to measure each level of achievement were given. A minimum score of 75% was considered as satisfactory.

REQUIREMENTS: Adequate lecture and laboratory facilities for the learner/performer to achieve the levels were provided. Each participant supplied his own paper, pen or pencil, books, and supplies as required. Each participant operated an installed system according to directions.

RATIONALE: Without knowledge, comprehension, and applications in the area to the indicated level, the participant will lack skills necessary to obtain a position and advance in his position at a satisfactory rate. With the growing complexity of technology and the high level of expenditure for research and development the well-trained participant will be in continued demand in the future. Operation of systems gives the mechanical technician valuable experience needed for production and management positions.

OUTCOME: Each participant is able to operate mechanical, electrical, magnetism, fluid, and heat systems.

TASK: **To Solve Mathematical Problems**

CRITERION: The training was judged successful when each participant had developed to a level of achievement within the estimated lecture/laboratory learning time. Examinations to measure each level of achievement were given. A minimum score of 75% was considered as satisfactory.

REQUIREMENTS: Adequate lecture and laboratory facilities for the learner/performer to achieve the levels were provided. Each participant supplied his own paper, pen or pencil, books, and supplies as required. Each participant was given problems in algebra, trigonometry, geometry, and introduction to calculus, and solved them to the above criterion.

RATIONALE: Without knowledge, comprehension, and applications in the area to the indicated level, the participant will lack skills necessary to obtain a position and advance in his position at a satisfactory rate. With the growing complexity of technology and the high level of expenditure for research and development the well-trained participant will be in continued demand in the future. A good mathematical background is required of the mechanical technician.

OUTCOME: Each participant is able to solve mathematical problems.

TASK: To Solve Algebra Problems

CRITERION: The training was judged successful when each participant had developed to a level of achievement within the estimated lecture/laboratory learning time. Examinations to measure each level of achievement were given. A minimum score of 75% was considered as satisfactory.

REQUIREMENTS: Adequate lecture and laboratory facilities for the learner/performer to achieve the levels were provided. Each participant supplied his own paper, pen or pencil, books, and supplies as required. Linear equations in one unknown, simultaneous linear equations, exponents, radicals and imaginary numbers, quadratic equations in one unknown problems were given and solved to the above criterion.

RATIONALE: Without knowledge, comprehension, and applications in the area to the indicated level, the participant will lack skills necessary to obtain a position and advance in his position at a satisfactory rate. With the growing complexity of technology and the high level of expenditure for research and development the well-trained participant will be in continued demand in the future. A good mathematical background is required of a mechanical technician.

OUTCOME: Each participant is able to solve algebra problems.

TASK: **To Solve Trigonometry Problems**

CRITERION: The training was judged successful when each participant had developed to a level of achievement within the estimated lecture/laboratory learning time. Examinations to measure each level of achievement were given. A minimum score of 75% was considered as satisfactory.

REQUIREMENTS: Adequate lecture and laboratory facilities for the learner/performer to achieve the levels were provided. Each participant supplied his own paper, pen or pencil, books, and supplies as required. Trigonometry of the right triangle, of the oblique triangle, vectors, analytical trigonometry, formulas, graphs of trigonometry, functions, radian measure, and translation of axis problems, were given and solved to the above criterion.

RATIONALE: Without knowledge, comprehension, and applications in the area to the indicated level, the participant will lack skills necessary to obtain a position and advance in his position at a satisfactory rate. With the growing complexity of technology and the high level of expenditure for research and development the well-trained participant will be in continued demand in the future. A good mathematics background is requisred of a mechanical technician.

OUTCOME: Each participant is able to solve trigonometry problems.

TASK: **To Translate Data**

CRITERION: The training was judged successful when each participant had developed to a level of achievement within the estimated lecture/laboratory learning time. Examinations to measure each level of achievement were given. A minimum score of 75% was considered as satisfactory.

REQUIREMENTS: Adequate lecture and laboratory facilities for the learner/performer to achieve the levels were provided. Each participant supplied his own paper, pen or pencil, books, and supplies as required. Each participant was given tables, reports, handbooks, numerical control tape, or computer data, and translated data into report, computer, numerical control tape, table, or graph form as specified by instructor.

RATIONALE: Without knowledge, comprehension, and applications in the area to the indicated level, the participant will lack skills necessary to obtain a position and advance in his position at a satisfactory rate. With the growing complexity of technology and the high level of expenditure for research and development the well-trained participant will be in continued demand in the future. Data is in many forms and must be translated correctly to be useable for reports or for the computer.

OUTCOME: Each participant is able to translate data.

TASK: To Interpret Data

CRITERION: The training was judged successful when each participant had developed to a level of achievement within the estimated lecture/laboratory learning time. Examinations to measure each level of achievement were given. A minimum score of 75% was considered as satisfactory.

REQUIREMENTS: Adequate lecture and laboratory facilities for the learner/performer to achieve the levels were provided. Each participant supplied his own paper, pen or pencil, books, and supplies as required. Each participant was given data from tables, reports, handbooks, numerical tapes, computer, or graphs, and interpreted correctly as specified by instructor.

RATIONALE: Without knowledge, comprehension, and applications in the area to the indicated level, the participant will lack skills necessary to obtain a position and advance in his position at a satisfactory rate. With the growing complexity of technology and the high level of expenditure for research and development the well-trained participant will be in continued demand in the future. Data is in many forms and must be interpreted correctly to be useable for reports or for the computer.

OUTCOME: Each participant is able to interpret data.

TASK: To Extrapolate Data

CRITERION: The training was judged successful when each participant had developed to a level of achievement within the estimated lecture/laboratory learning time. Examinations to measure each level of achievement were given. A minimum score of 75% was considered as satisfactory.

REQUIREMENTS: Adequate lecture and laboratory facilities for the learner/performer to achieve the levels were provided. Each participant supplied his own paper, pen or pencil, books, and supplies as required. Each participant was given data from tables, reports, handbooks, numerical tapes, computer, or graphs, and extrapolated data correctly as specified by instructor.

RATIONALE: Without knowledge, comprehension and applications in the area to the indicated level, the participant will lack skills necessary to obtain a position and advance in his position at a satisfactory rate. With the growing complexity of technology and the high level of expenditure for research and development the well-trained participant will be in continued demand in the future. Data has to be extrapolated correctly for proper analysis.

OUTCOME: Each participant is able to extrapolate data.

TASK: **To Know And Comprehend Physical Science**

CRITERION: The training was judged successful when each participant had developed to a level of achievement within the estimated lecture/laboratory learning time. Examinations to measure each level of achievement were given. A minimum score of 75% was considered as satisfactory.

REQUIREMENTS: Adequate lecture and laboratory facilities for the learner/performer to achieve the levels were provided. Each participant supplied his own paper, pen or pencil, books, and supplies as reqiored; Each participant was given facts about mechanics, electricity and magnetism, heat, light, sound, optics, and nuclear systems, and required to retain these facts to the above criterion:

RATIONALE: Without knowledge, comprehension, and applications in the area to the indicated level, the participant will lack skills necessary to obtain a position and advance in his position at a satisfactory rate. With the growing complexity of technology and the high level of expenditure for research and development the well-trained participant will be in continued demand in the future. Before physical sciences can be applied, knowledge and comprehension of the subject has to be gained.

OUTCOME: Each participant has knowledge and comprehension of the physical sciences.

TASK: **To Apply Knowledge Of Physical Science**

CRITERION: The training was judged successful when each participant had developed to a level of achievement within the estimated lecture/laboratory learning time. Examinations to measure each level of achievement were given. A minimum score of 75% was considered satisfactory.

REQUIREMENTS: Adequate lecture and laboratory facilities for the learner/performer to achieve the levels were provided. Each participant supplied his own paper, pen or pencil, books, and supplies as required. Students were given knowledge of physical science in areas of mechanics, electricity, magnetism, heat, light, sound, optics, and nuclear, and required to make applications of each area by experiments set up by instructor or student.

RATIONALE: Without knowledge, comprehension, and applications in the area to the indicated level, the participant will lack skills necessary to obtain a position and advance in his position at a satisfactory rate. With the growing complexity of technology and the high level of expenditure for research and development the well-trained participant will be in continued demand in the future. Principles have to be applied to truly be understood. The other areas of physical science are applied in section one.

OUTCOME: Each participant is able to make applications in the following physical science areas: light, sound, optics, and nuclear.

TASK: **Make A Face Frame**

CRITERION: The instructor will evaluate the face frame for squareness, accurate measurements, visual appearance, tight joints, and smooth surfaces.

REQUIREMENTS: Acquire or make a working drawing of the job. Make out a cutting list for the face frame stock. Machine out the stock. Lay out the location of all joints. Bore the dowel holes. Assemble (glue and clamp).

RATIONALE: It is important for the cabinetmaker to know how to layout and construct face frames because 90% of all custom-made cabinets utilize a face frame to keep the cabinet square and to provide an area for scribing to the walls and to allow proper space for hinges.

OUTCOME: The student will be able to lay out, machine, and assemble a cabinet face frame.

TASK: **Make A Lipped Drawer**

CRITERION: The drawer should fet the opening with proper clearance on each side and at the top. The instructor will evaluate the workmanship as to accuracy of measurements and appearance.

REQUIREMENTS: Procure drawer specification. Measure opening and determine the length of the drawer and make out a cutting list for materials. Machine out stock. Lay out guide lines for machining. Machine to detail.

RATIONALE: Every cabinetmaker must be able to build drawers of all kinds. Lipped drawers are frequently used in cabinetmaking because they are very easy to fit into the cabinet. Drawers must be soundly built to withstand frequent opening and closing.

OUTCOME: The student will be able to machine out and assemble a lipped drawer.

TASK: **Construct A Glued Up Panel**

CRITERION: The instructor will evaluate the glued up panel for squareness, accuracy of measurements, visual appearance, a flat, smooth surface, and tight joints.

REQUIREMENTS:

1. From the cutting list, rough cut enough stock to make the panel.
2. Plane one surface and two edges. Edges should be "spring-type" joints.
3. Arrange stock for gluing by making sure all grain runs in the same direction, matching the color, and making certain that the annular rings on the ends of the stock face in directions to those of the adjoining pieces.
4. Check all joints for proper fit.
5. Glue and clamp (make sure the surface is flat).
6. Remove excess glue with a scraper when jelled.
7. Surface to thickness and trim to size.

RATIONALE: If a piece of furniture or a cabinet is to be made of solid wood, one of the first steps the cabinetmaker must take is the making of large parts. Table tops, cabinet ends, etc. must be made by gluing stock to form large areas or surfaces.

OUTCOME: The student will be able to machine out and glue up stock to make a solid wood panel.

TASK: **Make A Lipped Cabinet Door**

CRITERION: The instructor will evaluate the door for squareness, accurate measurements, visual appearance, and smooth surfaces.

REQUIREMENTS: Procure the offset cabinet hinges specified for the job. Measure the opening and make out a cutting list. Cut out stock material to size. Machine to detail. Fill all voids and sand all surfaces.

RATIONALE: One of the important jobs in cabinetmaking is the making of doors. The lipped door does not require as accurate fitting as some other types, since the door itself covers part of the frame. In this manner labor costs are kept to a minimum.

OUTCOME: The student will be able to machine out a lipped cabinet door, using three fourths inch good two-side plywood.

TASK: **Make A Gavel**

CRITERION: The instructor will evaluate the finished product as to accuracy of measurements and visual appearance.

REQUIREMENTS: Acquire or make a working drawing of the gavel to be made. Make a cutting list. Machine out stock. Center stock for turning between centers on the lathe. Turn stock to detail. Sand to correct dimensions. Remove from lathe and cut off the ends of the stock and finish the surface. Place the head of gavel in a "V" block and bore the hole for handle. Assemble and prepare for finish.

RATIONALE: Wood turning, while not difficult to learn, is one of the more fascinating tasks enjoyed by the craftsman. There are two basic types of lathe work: spindle turning and faceplate turning. This project requires spindle turning. Those who restore and rebuild antique furniture or must turn original patterns used to set the knives for the automatic lathe must master woodturning techniques.

OUTCOME: The student will be able to machine out and assemble a gavel to a given detail.

TASK: **Make A Self-Edged Plastic Laminated Table**

CRITERION: The finished project will be evaluated by the instructor as to the following: (1) accurate dimensions, (2) quality of workmanship; tight joints, smooth surfaces, and no machine marks or fingerprints.

REQUIREMENTS: Read specifications as to color of plastic covering and width of self-edging. Acquire dimensions for the top. Make a cutting list for materials. Machine stock to dimensions. Apply self-edging first and trim. Apply the top covering and trim. Ease all edges with fine sand paper. Clean off all glue and fingerprints.

RATIONALE: The cabinetmaker is called upon to do plastic laminating mostly on tops of cabinets or tables, however, in some cases complete cabinets are covered with the plastic covering to withstand hard usage such as cabinets for restaurants, hotels, and motels. Workmanship in this area of construction must be of highest quality.

OUTCOME: The student will be able to make a plastic laminated, self-edge top for a table.

TASK: **Make A Picture Frame**

CRITERION: The instructor will evaluate the frame as to squareness, accuracy of measurements, visual appearance, tight joints, and a smooth surface with no visible machine marks.

REQUIREMENTS: Acquire or make a working drawing, showing a detail of the moulding. Make a cutting list and get out stock. Machine stock to detail. Miter stock to picture dimensions. Assemble and clean up all joints and machine marks.

RATIONALE: The making of picture frames has become quite a business in itself. Furthermore, the general craftsman is called upon not only to make picture frames but also to cut and fit many miter joints similar to those on a picture frame, on other woodworking projects.

OUTCOME: The student will be able to make a picture frame from given details and dimensions.

TASK: **Make A Bookcase**

CRITERION: The instructor will evaluate the bookcase as to squareness, accuracy of measurements, visual appearance, tight joints, and smooth surfaces.

REQUIREMENTS: Acquire the plans and specifications for the bookcase. Make out a cutting list. Machine out the stock needed. Lay out the location of all joints. Machine to detail. Assemble and clean up all machine marks.

RATIONALE: Bookcases are very simple to make and are in constant demand. The cabinetmaker will be called upon to construct many cases of this type and will have constant need for the knowledge acquired by constructing the joints used in this project.

OUTCOME: The student will be able to lay out, machine, and assemble a bookcase from given dimensions and specifications.

TASK: **Make Ten Finishing Test Panels**

CRITERION: All finishing samples will be graded by the instructor. The criteria used are the following: appearance, procedure used, quality of finish, and method of application of finishes.

REQUIREMENTS: Acquire ten different species of wood samples, eight inches by twelve inches. From the information given in your text, (section fifty-eight of Feirer, Cabinetmaking And Millwork) develop ten finishing samples. Prepare a procedure list for each finish and attach it to the back of each sample, covering the following information:

1. Preparation of surface - What was done?
2. Stain, bleach, or toner - What was applied?
3. Seal - What was used and how much?
4. Fill - How was this done?
5. Build - How many coats of what materials?
6. Top coat - How many coats of what material?
7. Rub - What was done?

RATIONALE: Finishing is a specialized skill in furniture factories and in construction and is usually done by painters. The cabinetmaker should have a good basic knowledge of the methods and various types of finishes used in industry.

OUTCOME: The student will be able to make finishing test panels from ten different species of wood and to make a procedure list for each type of finish and attach them to the backs of the panels.

TASK: **Construct A Door Frame**

CRITERION: The instructor will evaluate the frame for squareness, accurate measurements, visual appearance, tight joints, and smooth surfaces.

REQUIREMENTS:

1. Acquire the information needed to build the frame for a particular type and size of door.
2. Layout and machine the moulded stock including dodoes, notches, and miters,
3. Assemble

RATIONALE: Standard parts and moulding for stock door frames are machined in the mill or cabinet shop on moulding machines. The skilled cabinetmaker or carpenter who can do accurate work is called upon to assemble the frames.

OUTCOME: The student will be able to construct an exterior door frame for a house from given information.

TASK: **Assembling The Oxyacetylene Outfit**

CRITERION: Assemble in proper sequence with equipment properly mounted to cylinders and welding tip properly attached to torch. It must have leaktight connections. The assembly time is five minutes.

REQUIREMENTS: The student will be required to secure cylinders, remove cylinder caps, crack cylinder valves, attach regulators, check regulator adjusting screws, connect hose to regulators, open cylinder valves, purge lines, connect hose to torch, connect top to torch, and adjust working pressure.

RATIONALE: The ability to assemble an oxyacetylene outfit is necessary for most welders in the shop or field. Proper assembly promotes efficiency, reduces accident possibilities, and lengthens the life of the equipment.

OUTCOME: The student will be able to assemble the oxyacetylene outfit.

TASK: **Lighting The Welding Torch**

CRITERION:

1. Light torch without soot, uncombusted carbon or smoke.
2. Proper adjustment to the three flames.

REQUIREMENTS:

1. Turn acetylene valve one-fourth turn.
2. Light flame with friction lighter.
3. Adjust acetylene until flame contacts tip.
4. Turn oxygen valve until the flame adjustment becomes neutral.

RATIONALE: The proper lighting of the torch and adjustment of the flame is essential to safe and efficient operation.

OUTCOME: The student will be able to light the torch and adjust the flame.

TASK: **Bead Welding -- Edge Joining**

CRITERION: Edges of plate are fused together with smooth, even ripples throughout entire length of bead, and the absence of pin holes, overlap and uneven ripples. It must have good connections at starting and stopping points and good general appearance.

REQUIREMENTS: The student is required to mild steel coupons as directed, tack plates at each end, and fuse edges without the use of a filler rod.

RATIONALE: The procedure is easy to master, starts with a simple type of weld, and encourages a puddling and fusion process. It utilizes one of the five basic joints as a means of joining metals.

OUTCOME: The student will be able to perform a proper bead weld with edges joining in a flat position.

TASK: **Bead Welding -- Corner Joining**

CRITERION: Edge of corner is fused together with smooth, even ripples, good appearance, and full penetration to inside of corner joint. It will be subject to successful destructive bend test.

REQUIREMENTS: The student is required to mild steel coupons as directed, tack plates at each end, weld plates, fusing edges without the use of filler rod, allow plates to cool slowly, and test as directed.

RATIONALE: A simple task which includes one of the five basic joints, develops a corner joining with full strength, and strengthens skill and ability precluding more difficult tasks.

OUTCOME: The student will be able to perform a proper bead weld with corners joining in a flat position.

TASK: **Puddling Without Filler Rod – Flat Position**

CRITERION: Even ripple effect, shape of ripple, straight beads, and the absence of holes will demonstrate the success of the puddling.

REQUIREMENTS: The student is required to mild steel coupon as directed, scribe four lines on plate, and run four straight beads on surface of plate.

RATIONALE: Puddling is necessary to develop a feel for the torch, to develop proper torch movement, and to lay the foundation for subsequent exercises.

OUTCOME: The student will be able to demonstrate puddling without filler rod in flat position.

TASK: **Puddling With Filler Rod – Flat Position**

CRITERION: Even ripples, shape of ripples, size of bead, proper face reinforcement, general appearance, and uniform straightness of beads will determine the success of the puddling.

REQUIREMENTS: The student is required to mild steel coupon as directed, scribe four lines on plate, and run four straight beads on plate, utilizing the three manipulative torch techniques using filler rod one-eighth inch.

RATIONALE: This procedure develops coordination of eye and muscle (two hands) and a foundation of skills and ability for all fusion welding processes.

OUTCOME: The student will be able to demonstrate puddling with filler rod in flat position.

TASK: **Bead Weld – Butt Joint – Flat Position**

CRITERION: The welding is judged by its smooth, even ripples, straight bead one-half inch wide, proper face reinforcement, proper root penetration, and subjection to successful destructive bend test.

REQUIREMENTS: The student is required to mild steel coupons as directed, space plates one-eighth inch apart, tack weld plates at each end, weld plates with one-eighth inch mild steel welding rod, and test as directed.

RATIONALE: This procedure utilizes one of the five basic joints; develops the ability and skill to obtain a full strength joint, a welded joint equal to that of the base material; and is the type of joint used most often by the welder.

OUTCOME: The student will be able to perform a satisfactory bead weld, square butt joint, flat position.

TASK: **Fillet Weld – Lap Joint – Flat Position**

CRITERION: The welding is judged by its smooth ripples, good fusion, general appearance, and destructive bend test.

REQUIREMENTS: The student is required to mild steel coupons as directed, tack ends of plates, use one-eighth inch filler rod, and test as directed.

RATIONALE: This procedure utilizes number four of the five basic joints, involves a fillet weld which must be mastered, the kind of a joining which will often be encountered, and develops the ability and skill to obtain 100% strength in a lap welded joint.

OUTCOME: The student will be able to perform a satisfactory fillet weld, lap joint, flat position.

TASK: **Fillet Weld -- Tee Joint -- Flat Position**

CRITERION: The welding is judged by its general appearance, smooth, even ripples, good stop and start connections, bead size and contour, proper fusion, absence of undercut and overlap, and subjection to successful destructive bend test.

REQUIREMENTS: The student is required to mild steel coupons as directed, tack plates at each end, use one-eighth inch mild steel filler rod, weld plates on one side only, produce a fillet weld of one-fourth to five-sixteenths of an inch, allow plate to cool slowly, and test as directed.

RATIONALE: This procedure completes the five basic joints. It involves a fillet weld which is difficult to master but encountered often in the welding vocation.

OUTCOME: The student will be able to perform a satisfactory fillet weld, tee joint, flat position.

TASK: **Groove Weld -- Vee Butt Joint -- Flat Position**

CRITERION: The welding is judged by its general appearance, smooth, even ripples, good stop and start connections, proper face reinforcement, proper root penetration, good fusion with absence of overlap and undercut, and subjection to successful guided bend test.

REQUIREMENTS: Mild steel coupons as directed, bevel plates 37 to 45 degrees, space plates one-eighth inch apart and tack weld at each end, weld plates with one-eighth inch mild steel filler rod, complete weld with either one or two passes as needed, utilize either the backhand or forehand technique, allow plates to cool slowly, and cut strips one inch from plate as selected by instructor. Subject one strip to a 180° guided root bend test. Subject the other strip to a 180° guided face bend test.

RATIONALE: As metal thickness increases, plate edge preparation must be used to obtain 100% strength in the joint; this joint requires beveling. The vee butt joint is necessary for the journeyman or certified welder to master for it prepares the welder for other vee butt operations such as vertical, horizontal, and overhead positions as well as pipe welding.

OUTCOME: The student will be able to perform a satisfactory groove weld, vee butt, flat position.

TASK: **Admission Of The Obstetric Patient To Labor And Delivery**

CRITERION: The teaching will be successful when the student is able to:

1. Establish a relationship of trust and confidence with the patient.
2. Take the vital signs and determine the stage of labor.
3. Prepare the mother for delivery both physically and mentally.

REQUIREMENTS: The training will take place during the nine week assignment to the obstetric ward. The student will have an opportunity to admit at least five mothers during her assignment to labor and delivery suite.

RATIONALE: The patient is admitted to the hospital to deliver her baby. The student will need to show interest and concern for the mother and the unborn child. It is necessary to observe the symptoms and the reaction of the mother to the discomfort being experienced.

OUTCOME: The student should be able to function as a safe, intelligent nurse in the care of the mother in labor.

TASK: **To Train The Student To Take Fetal Heart Tones**

CRITERION: The teaching will be successful when the student is able to find and count the fetal heart tones correctly. This will be determined by checking with the student and checking the fetal heart tones. The student will be judged competent when her count is the same as that of the instructor.

REQUIREMENTS: The training will take place during the student assignment to labor and delivery. The student will be assigned at least five patients in labor.

RATIONALE: The baby's condition needs to be observed carefully during the labor phase. Complications can often be anticipated by the physician as a result of the fetal heart tones obtained by the nurse.

OUTCOME: The student should be able to locate and count the fetal heart tones.

TASK: **To Teach The Student To Prepare The Mother For Delivery**

CRITERION: The teaching will be successful when the student is able to perform a perineal prep and give an enema without contaiminating the birth canal.

REQUIREMENTS: The training will take place during the nine-week assignment to the obstetric unit. The student will be allowed to prepare at least five patients for delivery.

RATIONALE: The patient and the baby should be protected from contamination and infection during the labor and delivery period. Major emphasis is placed on preventing the introduction of bacteria into the birth canal.

OUTCOME: The student should be able to shave the perineum without cutting or scraping the skin and to give an enema without danger to the baby or mother.

TASK: **To Teach The Student To Set Up The Delivery Room For The Final Stage Of Labor**

CRITERION: The teaching will be successful when the student is able to set up the delivery room without contaminating the sterile field.

REQUIREMENTS: The student will be given the assignment of and be responsible for, setting up at least five delivery rooms.

RATIONALE: The obstetrical packs need to be opened and arranged for use by the physician and nurses at the time of delivery. The packs consist of sterile equipment needed during the delivery of the baby. These packs must be opened and the pans filled with solution, without contaminating the sterile field.

OUTCOME: The student should be able to perform assigned tasks in preparing the delivery room.

TASK:	**Identification Of The Newborn Infant**
CRITERION:	The teaching will be considered successful when the student demonstrates the ability to identify the mother and baby.
REQUIREMENTS:	The student will be given an assignment to issue identification for the newborn infant during the time that she spends in the obstetric division.
RATIONALE:	Immediately after the delivery of the infant, the mother and baby are each given an identification number to avoid any possibility of giving the wrong infant to a mother. A clear plastic band that consists of a mother and baby section is obtained, cut apart and placed on the respective wrists of the mother and child.
OUTCOME:	The student should demonstrate the ability to place the identification bands on the mother and baby before either leaves the delivery room.

TASK:	**To Teach The Student To Clean Up The Delivery Room Following The Delivery Of The Infant**
CRITERION:	The teaching will be considered successful when the student is able to remove all traces of the previous delivery and leave the room ready for the next patient.
REQUIREMENTS:	The student will be assigned to clean five delivery rooms.
RATIONALE:	Following the birth of the baby, the mother is moved to the postpartum section and the baby to the newborn nursery. It is then necessary to prepare the room for the next patient.
OUTCOME:	The student should be able to dispose of the placenta, wash the instruments, place the soiled linen in the hamper, wash down the room with Zepherin 1:1000, and return supplies to their proper places.

TASK: **To Teach The Immediate Care Of The Postpartum Patient**

CRITERION: The teaching will be considered successful when the student is able to recognize the symptoms of hemorrage and hypertension.

REQUIREMENTS: The student will be assigned to care for at least five mothers following delivery.

RATIONALE: During the first hour following delivery, the mother must be observed closely for evidence of hemorrhage, hypotension or a relaxed fundus.

OUTCOME: The student should be able to measure and record the blood pressure, pulse and respirations, and to massage the fundus and observe the patient for bleeding.

TASK: **To Teach The Student To Admit The Baby To The Newborn Nursery**

CRITERION: The teaching will be considered successful when the student is able to obtain an accurate weight, measure the head and chest and the length from the heel to the top of the head accurately.

REQUIREMENTS: The student will admit at least five babies to the newborn nursery.

RATIONALE: When the infant is admitted to the nursery, it is weighed and measured to establish a base from which to observe future growth and development.

OUTCOME: The student should be able to weigh and measure the newborn baby accurately and to record the results.

TASK: **Teaching The Mother To Breast Feed Her Infant**

CRITERION: The teaching will be considered successful when the student can apply the recommended physical and psychological encouragements to comfortable breast feeding.

REQUIREMENTS: The student will be given an opportunity to teach the mother the advantage and satisfaction of breast feeding during her assignment to the newborn nursery.

RATIONALE: The success of breast feeding is dependent upon the satisfaction and pleasure derived by the mother during her early experience. Following the birth of the baby, there is a period when insufficient milk is available. It is necessary to encourage the mother to assume a comfortable position and to hold the infant so that nursing can be achieved without effort on the part of either the mother or child. Nursing should be a time of relaxation and enjoyment for both the mother and baby.

OUTCOME: The student should be able to assist and encourage the mother to breast feed her baby.

TASK: **To Teach The Student How To Discharge The Mother From The Hospital**

CRITERION: The teaching will be judged successful when the student can apply her training to assist the patient as needed.

REQUIREMENTS: The student will be given the opportunity to discharge at least five mothers during her nine-week experience in obstetrics.

RATIONALE: Preparing the mother for discharge by helping her to dress and collect her personal belongings can help to make the mother feel that her welfare and comfort are important to the nurse. Since discharge takes place before complete recovery from the delivery of the baby, the patient should be given whatever assistance is necessary.

OUTCOME: The student should be able to assist the patient in preparing to leave the hospital and to aid in making her departure safe and pleasant.

TASK: **Oral Measurement Of Body Temperature**

CRITERION: The student must be able to read the thermometer within 0.1 of one degree to be considered accurate.

REQUIREMENTS: The student must take, read, and record five (5) oral temperatures for five (5) different hospitalized patients. These five (5) oral temperatures will be checked by the clinical instructor before the student will be considered proficient.

RATIONALE: Accuracy in taking and reading oral temperatures is vital to good nursing care since the body temperature is checked at least once daily on hospitalized patients.

OUTCOME: Given an oral clinical thermometer for measuring body temperature, the student will be able to take and accurately read and record an oral body temperature.

TASK: **To Give A Cleansing Bed Bath**

CRITERION: The student will be able to give a cleansing bed bath to a hospitalized patient using acceptable techniques and within the time period of one specific hospital laboratory assignment.

REQUIREMENTS: In the school laboratory setting, the student must demonstrate the acceptable techniques for giving a cleansing bed bath. The observing instructor must grade the student as acceptable before the student will be assigned this nursing function in the hospital. This demonstration will take place during a regularly scheduled school laboratory period, not more than four weeks after the class presentation of "Giving a Cleansing Bed Bath".

RATIONALE: Maintaining the good personal hygiene of the patient is essential to the practice of modern nursing, and is part of every patient's daily care.

OUTCOME: Given towels, a washcloth, bath blanket, soap, and a basin of water, the student will be able to quickly and efficiently give a cleansing bed bath.

TASK: **To Make An Unoccupied Hospital Bed**

CRITERION: The student will be able to make an unoccupied hospital bed in an acceptable and efficient manner, within a time period of ten minutes.

REQUIREMENTS: In the school laboratory setting the student must demonstrate to the instructor the ability to make an unoccupied hospital bed in the acceptable manner, within a specified ten minute period. This exercise will be assigned during a regularly scheduled school laboratory period, not more than four weeks after the class presentation of "Making an Unoccupied Hospital Bed". The student will not be assigned to patient care in the hospital until receiving a satisfactory grade from the observing instructor.

RATIONALE Efficiency and skill in bedmaking is synonymous with good nursing care and is basic to providing care and comfort to the patient.

OUTCOME: Given an unoccupied hospital bed and the necessary linen, the student will be able to make the bed efficiently, neatly and with acceptable speed.

TASK: **To Count The Radial Pulse**

CRITERION: The student must be able to accurately count and record the radial pulse rate/minute for any patient.

REQUIREMENTS: In the school laboratory setting the student must demonstrate to the instructor the ability to count and record the radial pulse rate/minute of five (5) individuals. The instructor will monitor the five rates immediately following the student.

RATIONALE: The pulse rate is one of the integral components of the body's vital signs, and the radial site is the one most frequently used to monitor it.

OUTCOME: Given a watch with a sweep second hand, the student will be able to accurately count and record the radial pulse rate.

TASK: **To Count The Respiration Rate**

CRITERION: The student must be able to accurately count and record the respiration rate/minute for any patient.

REQUIREMENTS: In the school laboratory setting the student must demonstrate to the instructor the ability to count and record the respiration rate/minute of five (5) individuals. The instructor will monitor the respiration rates as the student takes them.

RATIONALE: The respiration rate is one of the body's vital signs and as such is checked frequently on most patients to guide the doctor in his treatment of the patient.

OUTCOME: Given a watch with a sweep second hand, pen and paper, the student will be able to accurately count and record the respiration rate.

TASK: **Handwashing**

CRITERION: The student must carry out proper handwashing techniques every time the hands are washed.

REQUIREMENTS: In the school laboratory setting the student must demonstrate to the instructor, the proper handwashing technique. The instructor must grade the student performance as acceptable before the student will be assigned to patient care in the hospital. The student will also be observed in the hospital setting for proper handwashing technique as part of the total care given by the student to assigned patients.

RATIONALE: Nurses must develop strong habits of good personal hygiene and proper nursing techniques. Handwashing is one of the most basic of these techniques and one of the most important ones.

OUTCOME: Given soap, (powdered, bar, or liquid) and clean running water, the student will be able to carry out basic handwashing technique.

TASK: To Administer Backcare

CRITERION: The student must be able to give systematic back care to any patient.

REQUIREMENTS: The student must demonstrate back care to the instructor in the school laboratory setting. This demonstration can be done on the medical doll or on individuals in the classroom and will take place approximately four (4) weeks after the class presentation of "Back Care".

RATIONALE: Back care is part of the daily hygiene needs of the patient. It stimulates circulation and soothes the skin and refreshes the patient.

OUTCOME: Given emollient solution, the student will be able to give systematic rubbing and stroking of the skin surface of the back.

TASK: To Use Sterile Glove Technique

CRITERION: The student must be able to put on a pair of sterile gloves without a break in sterile technique.

REQUIREMENTS: The student must demonstrate to the instructor in the school laboratory setting the ability to put on a pair of sterile gloves. This will be done during a regularly assigned laboratory period approximately three (3) weeks following the class presentation of "Sterile Glove Technique".

RATIONALE: No break in sterile technique can be tolerated in the practice of nursing. The patient's life may depend on the technique of medical personnel ministering to him.

OUTCOME: Given a package of sterile, medical gloves, the student will be able to put on the gloves while maintaining sterile technique.

TASK: **To Count The Apical Rate**

CRITERION: The student must be able to count accurately and record the apical heart rate over a period of one full minute.

REQUIREMENTS: The student must demonstrate to the instructor, the ability to count and record five (5) apical heart rates in the school laboratory setting. The five (5) readings will be monitored by the instructor as the student takes them by using a double stethoscope. The student must receive a satisfactory grade from the instructor before being assigned this task in the hospital setting.

RATIONALE: Not all of the heart beats can be counted at the radial site. In order to get an accurate heart rate the apical site must be used.

OUTCOME: Given a stethoscope, pen and paper, the student will be able to count and record an apical heart rate.

TASK: **To Measure The Arterial Blood Pressure**

CRITERION: The student must be able to measure the arterial blood pressure within + or - 10 points on the mercury or air manometer.

REQUIREMENTS: The student must measure and record five (5) arterial blood pressures on different hospitalized patients. The five (5) readings will be monitored by the clinical instructor. The student must receive a satisfactory grade on the five readings before being allowed to procede with the program. This will be completed by the midterm of the first semester.

RATIONALE: Arterial blood pressure is one of the vital signs of the body that the doctor relies on to help guide him in the treatment of the patient. Accuracy in measurement and recording of the arterial blood pressure by the nurse is essential to quality nursing care.

OUTCOME: Given a sphygmomanometer and a stethoscope, paper and pen, the student will be able to measure and record the arterial blood pressure.

TASK: **Layout And Fabrication Of Transition Fittings**

CRITERION: The fittings will be evaluated by the instructor as to their accuracy and appearance. The fittings should be well shaped and have tight, even joints. Soldering should be even and water tight. The size of the fittings should be accurate enough so that they will fit into a duct system.

REQUIREMENTS:

1. Lay out fittings in drafting room following the procedure as outlined in the textbook.
2. Transfer patterns to metal in shop.
3. Cut out pieces with hand snips.
4. Notch and mark pieces.
5. Bend seam.
6. Form pieces on rolls and brake.
7. Seam pieces together.
8. Assemble pieces together into final fitting.

RATIONALE: The sheet metal worker must know how to make all types of transition fittings because they are used in air conditioning duct systems to increase or decrease the size of the ducts in the system.

OUTCOME: The student will be able to lay out and fabricate four transition fittings including: round-to-round transition, square-to-round transition, off center round-to-round transition, and square-to-square transition.

TASK: **Layout And Fabrication Of Elbows**

CRITERION: The fittings will be evaluated by the instructor as to their accuracy and appearance. The fittings should be well shaped and have tight, even joints. The size of the fittings should be accurate enough so that they will fit into a duct system.

REQUIREMENTS:

1. Lay out fittings in the drafting room following the procedure as outlined in the textbook.
2. Transfer pattern to metal in shop.
3. Cut out pieces with hand snips.
4. Notch and mark pieces.
5. Bend seams.
6. Form pieces on rolls or brake.
7. Seam pieces together.
8. Assemble pieces into final fitting.

RATIONALE: The sheet metal worker must know how to make all types of elbow fittings because they are used in air conditioning duct systems to change direction of the duct line.

OUTCOME: The student will be able to lay out and fabricate four elbow fittings including: round elbow, rectangular elbow, change elbow, and transition elbow.

TASK: **Layout And Fabrication Of Offset Fittings**

CRITERION: The fittings will be evaluated by the instructor as to their accuracy and appearance. The fittings should be well shaped and have tight, even joints. The size of the fittings should be accurate enough so that they will fit into a duct system.

REQUIREMENTS:
1. Lay out fittings in the drafting room following the procedure as outlined in the textbook.
2. Transfer patterns to metal in shop.
3. Cut pieces out with hand snips.
4. Notch and mark pieces.
5. Bend seams.
6. Form pieces on rolls and brake.
7. Assemble pieces into final fitting.

RATIONALE: The sheet metal worker must know how to make all types of offset fittings because they are used in air conditioning duct systems to exact jogs in the cut line.

OUTCOME: The student will be able to lay out and fabricate three offset fittings including: simple offset, change offset, and transition offset.

TASK: **Layout And Fabrication Of Branch Fittings**

CRITERION: The fittings will be evaluated by the instructor as to their accuracy and appearance. The fittings should be well shaped and have tight, even joints. The size of the fittings should be accurate enough so that they will fit into a duct system.

REQUIREMENTS:
1. Lay out fittings in the drafting room following the procedure as outlined in the textbook.
2. Transfer the patterns to the metal in the shop.
3. Cut out pieces with hand snips.
4. Notch and mark pattern.
5. Bend seams.
6. Form pieces on rolls and brake.
7. Seam pieces together.
8. Assemble pieces into final fittings.

RATIONALE: The sheet metal worker must know how to make all types of branch fittings because they are used in air conditioning duct systems to divide the system into different branches.

OUTCOME: The student will be able to lay out and fabricate four branch fittings including: square "Y" branch, square transition "Y" branch, round "Y" branch, and round transition "Y" branch.

TASK: **Layout And Fabrication Of Roof Flashing**

CRITERION: The finished pieces of flashing shall be evaluated by the instructor as to their accuracy and appearance. The flashing should be well shaped and have sharp, even bends. Chimney crickets and valley flashing should be constructed to the proper pitch so that they will fit the roof slope of the job. Cap strip should be made slightly larger than the cornice used on the job to allow for roofing paper to fit behind it.

REQUIREMENTS:

1. Lay out patterns for flashing in the drafting room following the procedures as outlined in the textbook.
2. Transfer patterns to metal in shop.
3. Cut flashing strips with hand snips.
4. Form flashing on brake.

RATIONALE: The sheet metal worker must know how to make all types of flashing that is used in roof construction. Flashing is used in conjunction with shingles to seal around openings in a roof.

OUTCOME: The student will be able to lay out and fabricate eight types of roof flashing including: gravel stop, cap strip, chimney flashing, chimney crickets, valley flashing, cornice, gutter, and side wall flashing.

TASK: **Layout And Fabrication Of Roof Jacks**

CRITERION: The roof jacks will be evaluated by the instructor as to their accuracy and appearance. They should be well shaped and have tight, even joints. The soldering should be even and water tight. The size of the jacks should be accurate enough so that they will do the job they were designed for.

REQUIREMENTS:

1. Lay out roof jacks in the drafting room following the procedure as outlined in the textbook.
2. Transfer patterns to metal in shop.
3. Cut pieces out with hand snips.
4. Notch and mark pieces.
5. Bend seams.
6. Form pieces on rolls and brake.
7. Seam pieces together.
8. Assemble pieces into final fittings.

RATIONALE: The sheet metal worker must know how to make all types of roof jacks because they are used quite extensively in building construction. They are used to seal the hole left in a roof for the passage of a fireplace chimney, vent pipe, or air conditioning duct.

OUTCOME: The student will be able to lay out and fabricate three roof jacks including: square roof jack, round tapered roof jack, and square-to-round roof jack.

TASK: **Layout And Fabrication Of An Exhaust Hood**

CRITERION: The hood will be evaluated by the instructor as to its accuracy and appearance. The hood should be square and have tight, even joints. Rivets should be neatly hammered and set.

REQUIREMENTS:

1. Lay out sections of hood directly on the metal in the shop.
2. Cut out pieces with hand snips.
3. Notch and mark pieces.
4. Bend seams in the brake.
5. Form pieces in brake.
6. Assemble pieces into finished hood.
7. Rivet seams together.

RATIONALE: The sheet metal worker must know how to make all types of exhaust hoods because they are used quite extensively in restaurants and industrial manufacturing plants to remove contaminated air from the working area.

OUTCOME: The student will be able to lay out and fabricate a satisfactory exhaust hood.

TASK: **Layout And Fabrication Of Fastenings**

CRITERION: The fasteners will be evaluated by the instructor as to their accuracy and appearance. All bends must be sharp. All joints must be tight. Rivets must be neatly hammered and set.

REQUIREMENTS:

1. Lay out fasteners directly on the metal in the shop.
2. Cut out fasteners with hand snips.
3. Notch fasteners with hand snips.
4. Form fasteners on bar folder or slip roll forming machine.
5. Assemble fasteners.

RATIONALE: The sheet metal worker must know how to lay out and fabricate all types of fastening devices because they are used to fasten sections of duct together in an air conditioning system.

OUTCOME: The student will be able to lay out and fabricate three fastening devices: government clip, S and drive clip, and draw band.

TASK: **Layout And Fabrication Of Louvers**

CRITERION: The louvers will be evaluated by the instructor as to their accuracy and appearance. All bends must be sharp. All joints must be tight. All spot welds must be sound. The louver blades must be level and evenly spaced. The louvers must be square with mitered corners. All soldering must be neat and water tight.

REQUIREMENTS:

1. Lay out fittings in drafting room following the procedure as outlined in the textbook.
2. Transfer patterns to metal in shop.
3. Cut out pieces with hand snips.
4. Notch and mark pieces.
5. Form pieces on brake.
6. Assemble louver by spot welding.
7. Fasten screen to back of louver with solder.
8. Solder bottom of louver bar to prevent leaking.

RATIONALE: The sheet metal worker must know how to make louvers because they are used quite extensively in the construction industry to seal openings left in walls for ventilation.

OUTCOME: The student will be able to lay out and fabricate a louver.

TASK: **Layout And Fabrication Of Vent Caps**

CRITERION: The vent caps will be evaluated by the instructor as to their accuracy and appearance. All bends must be sharp. All joints must be tight. All soldering must be neat and water tight.

REQUIREMENTS:

1. Lay out vent caps in the drafting room following the procedure outlined in the textbook.
2. Transfer patterns to metal in shop.
3. Cut out pieces with hand snips.
4. Notch and mark pieces.
5. Bend seams.
6. Form pieces on rolls or brake.
7. Seam pieces together.
8. Assemble pieces.
9. Solder vent caps.

RATIONALE: The sheet metal worker must know how to make all types of vent caps because they are used quite extensively on vent pipes to prevent water from entering the vent.

OUTCOME: The student will be able to fabricate four vent caps: flat caps, pitched caps, china caps, and bonnet caps.

TASK: **The Ability To Determine Eligibility For Public Assistance**

CRITERION: To qualify under regulations established by federal and state legislation, interpreted by county policy.

REQUIREMENTS:

1. Deprivation must be established.
2. Real property value of no more than $5,000.00, excluding place of residence.
3. Personal property value of no more than $600.00.
4. Determination of need, special needs, and budget allocation.
5. Verification of information.
6. Case administration.

RATIONALE:

1. Granting or denying public assistance is the key to the operation of the entire welfare system.
2. Accurate knowledge of rules and regulations is the key to swift determination of eligibility.
3. The range of requirements specified is typical of those encountered in eligibility determination.

OUTCOME: The student will be able to establish a sound basis for granting or denying public assistance.

TASK: **The Ability To Identify And Correctly Perceive Patterns Of Normal Individual And Family Functioning**

CRITERION: The satisfactory identification of factors creating a breakdown.

REQUIREMENTS:

1. Define normal family patterns, taking into consideration variations for social class, ethnic, and racial backgrounds.
2. From narrative case description isolate physical conditions of individual family members, psychic response patterns to functional responsibilities.
3. Isolation of the prime cause of pathological symptoms.
4. Recommendation of treatment resources.

RATIONALE:

1. The social service technician deals directly with people who have problems.
2. They are dealt with at a point where their social behavior has been unsuccessful, unacceptible, or even antisocial.
3. Each case involves individuals who have been unable to meet one or more of the expectations society has established for family solidarity, or social adjustment.
4. The technician must have knowledge of what is socially acceptable behavior, in order to isolate what is socially unacceptable behavior.

OUTCOME: The student will be able to recommend solutions to problems. created by breakdowns in social functioning as observed in family situations.

TASK: **The Ability To Categorize The Process of Community Problems Identification**

CRITERION: Placement into one of three standard categories.

REQUIREMENTS:

1. Categorize at least 18 out of 20 cases.
2. Problems that are of recognized community concern and about which the community is committed to intervene.
3. Presented in narrative form.
4. With the use of standard reference forms.
5. Within time period specified by instructor.

RATIONALE:

1. Society cannot and does not directly concern itself with every problem that every individual has.
2. Knowledge of a method of categorization is necessary to recognize what the community will involve itself in.
3. This categorization is a problem base that
    1. can be consistently and objectively applied to all cases without variations or inconsistencies stemming from individual judgements and biases.
    2. has a firm underlying rationale that gives unity and conceptual meaning to the area as a whole.

OUTCOME: The student will be able to classify specific types of human behavior as seen by the community.

TASK: **The Ability To Classify Restricted Behavior**

CRITERION: Correct classification of at least 70% of all cases examined within a time limit established by the instructor.

REQUIREMENTS:

1. Given 20 cases of restricted behavior, ranging from child separation (placement) to school dropouts.
2. A time limit of no more than 50 minutes in which to read and classify the cases.

RATIONALE:

1. The responsibility of recognizing and classifying restricted behavior occurs daily on the job. The successful social service technician must be able to perform this task quickly and efficiently.

OUTCOME: The student will be able to classify restricted behavior.

TASK: **The Ability To Classify Prohibited Behavior**

CRITERION: Correct classification of at least 70% of all cases examined, within time limit established by instructor.

REQUIREMENTS:
1. Given 20 cases of prohibited behavior, ranging from desertion to major felonies.
2. A time limit of not more than 50 minutes in which to read and classify the cases.

RATIONALE: The responsibility of recognizing and classifying prohibited behavior occurs daily on the job. The successful social service worker must be able to perform this task quickly, and in some cases immediately.

OUTCOME: The student will be able to classify prohibited behavior.

TASK: **The Ability To Classify Behavior Requiring Protective Intervention**

CRITERION: Correct classification of at least 70% of all cases examined, within the time period established by the instructor.

REQUIREMENTS:
1. Given 20 cases concerning protective intervention, ranging from juvenile admissions to mental institutions to total dependency.
2. A time limit of 50 minutes in which to read and classify the cases.

RATIONALE: The responsibility of recognizing and classifying behavior requiring preventive intervention occurs frequently on the job. The successful social service technician must be able to perform this task quickly and efficiently.

OUTCOME: The student will be able to classify behavior requiring protective intervention.

TASK: **The Ability To Conduct An Interview**

CRITERION: Out of ten specific items of information, requested by the instructor, the student must obtain a minimum of 7 within the time specified.

REQUIREMENTS:

1. Information will be obtained from a cooperative "client" utilizing the conversational method.
2. The student will obtain the information from the "client" answering the questions supplied by the instructor.
3. Within a time period of 15 minutes.

RATIONALE: The responsibility of obtaining information through direct face-to-face contact with clients occurs daily on the job. The successful social service worker must master this technique quickly and efficiently.

OUTCOME: The student shall be able to obtain specific information from a "client" during a simulated interview.

TASK: **The Ability To Observe Applicants Skillfully**

CRITERION: Out of ten specific "observational clues" the student must obtain a minimum of 7 within the time specified by the instructor.

REQUIREMENTS:

1. Observations will be made of a cooperative "client" being interviewed by a "social service technician".
2. The student will identify non-verbal actions that appear to be in contradiction to verbal responses, as stated by the "client".

RATIONALE: The responsibility of utilizing all the senses to obtain and mentally verify information received during the interview occurs daily on the job. The successful social service technician must master these techniques quickly in order to improve his effectiveness.

OUTCOME: The student shall be able to obtain clues from the senses of sight and hearing which will be used to supplement verbal communication.

TASK: **The Ability To Utilize A Systematic Approach In The Identification And Analysis Of The Problems Of Social Functioning.**

CRITERION: Identification of the major causative factor involved in a case narrative, within the time limit established by the instructor.

REQUIREMENTS:
1. Given a case narrative containing at least one major causative factor.
2. Apply the systematic approach as memorized.
3. Identify the major causative factor within 10 minutes.

RATIONALE: The responsibility of identifying and analyzing the major causative factor in problems of social functioning is a frequent task of the social service technician. The successful technician must master these techniques early in order to serve his clients with maximum effectiveness.

OUTCOME: The student will be able to identify the causative factors associated with problems of social functioning, derived through systematic deductive analysis.

TASK: **The Ability To Formulate Diagnostic Conclusions Concerning Problems Of Social Functioning.**

CRITERION: Formulations of diagnostic conclusions, based on prior analysis and identification, derived from a case narrative and within the time limit established by the instructor.

REQUIREMENTS:
1. Given a case narrative that includes the identification of a major problem of social functioning.
2. Develop diagnostic conclusions utilizing any reference material desired.
3. Within 30 minutes.

RATIONALE: The responsibility of formulating diagnostic conclusions concerning continuing problems of social function is often faced by the social service technician. The successful technician must be able to formulate these conclusions with the assistance of appropriate reference material.

OUTCOME: The student will be able to formulate diagnostic conclusions concerning problems of social functioning.

TASK:	**Crime Scene Investigation**
CRITERION:	The training will be successful when each student can investigate a crime through a simulated crime scene, locate a suspect, and produce evidence to support his suspicions. The physical evidence will be properly located, collected, marked and maintained in accordance with current courtroom practices. Any information gathered through interview or interrogation will be properly signed and acknowledged by the interviewee, or suspect, and obtained in accordance with Miranda warnings and rules of evidence.
REQUIREMENTS:	The student will be given a simulated crime scene in the crime lab, pieces of physical evidence, and witnesses/suspects. He will be allowed a total of two lab hours in which to investigate the crime and correctly identify the suspect.
RATIONALE:	Police officer, whether in patrol, juvenile, or investigative divisions, will be called upon at some time in their careers to conduct crime scene investigations. The success or failure of criminal prosecution will depend largely upon his actions at the original scene. Since an officer seldom has a second chance to investigate a particular scene, he must know how to conduct his investigation correctly the first time.
OUTCOME:	The student will be able to apply the proper methodology of crime scene investigation.

TASK: **An Understanding of the Elements of California Criminal Law**

CRITERION: The training will be judged successful when each student can pass a written examination with a score of 75% or above, and hand in two acceptable case briefs. The criteria for testing will be:

1. Students should be able to identify the types of intent and negligence required for crime in California.
2. Students should be able to list and explain those provisions of the Penal Code which are utilized most often by the field officer.
3. The student should be able to read a description of an actual incident and determine what laws have been violated, and explain the corpus delecti of each.
4. Students should be able to understand and define legal terminology.
5. Students should be able to read and understand written law cases to the extent that he can write an effective and understandable case brief acceptable by court standards.

REQUIREMENTS: This is a 3 unit class, instruction taking place in T-500 3 hours per week for 18 weeks. The student will be required to furnish a copy of the current California Penal Code, plus his own notebook and pencil. In addition, the student will be required to write and hand in at least two case briefs at times designated by the instructor.

RATIONALE: The basis for any police agency is the law which it enforces. Without a good working knowledge of the laws, no police officer could function effectively. In recent years, not only have the laws themselves become more complex, but the public has become increasingly aware of what the laws mean, and what their rights are under these laws. The police officer now needs a much more thorough grounding in the plethora of laws which exist. As police agencies have neither the time nor the facilities for the training necessary, this responsibility has devolved on the college system.

OUTCOME: The student will have sufficient understanding of California criminal law to enable him to function effectively as a law enforcement officer in California.

TASK: **Juvenile Procedures**

CRITERION: The training will be judged successful when the student can pass a written final examination with a score of 75% correct. The criteria for testing will be:

1. Students should be able to identify the general areas of socio-economic change, and their effect on youth.
2. Students should be able to list and explain legal theories basic to the development of juvenile court systems and procedures.
3. Students should understand available prevention programs and be able to list and identify prevention conceptualizations.
4. Students should be able to list and apply juvenile court law in practical situations.
5. Students should be able to identify the organization, functions, and jurisdiction of juvenile agencies and courts.

REQUIREMENTS: This is a 3 unit class, instruction taking place in the police science building one hour per day, 3 days per week, for a total of 18 weeks. Students will be required to furnish their own texts, pencils and notebooks, and will be required to write a ten page researched paper on some aspect of juvenile procedures selected by themselves and approved by the instructor.

RATIONALE: While only a select few police officers will be assigned specifically to the Juvenile division, all officers will at one time or another come into contact with juveniles. Some of these will be arrest situations in which it will be necessary that the officer have a good working knowledge of juvenile laws and procedures. More often, however, the officer will make contacts which will enable him to prevent delinquent activity. If the officer has at least a basic knowledge of juvenile psychology and preventive techniques, he may be able to prevent delinquent activity before it takes place, and consequently help a juvenile before he gets into trouble with the law.

OUTCOME: The student should understand the proper procedures for dealing with juvenile problems, and the laws and psychological factors affecting juvenile delinquency.

TASK: **Preparation Of Evidence**

CRITERION: The training will be judged successful when each student can pass a written test on the laws of evidence with a score of 75% or higher, and collect and preserve for court presentation at least 4 items of physical evidence. The criteria for testing will be:

1. To what extent can the student identify the several types and classifications of evidence, and explain the difference between them?
2. To what extent is the student able to interpret the laws relating to admissibility of physical evidence?
3. How well is the student able to apply the laws to collection, presentation, and introduction into court of evidence gathered at the scene of a crime?

REQUIREMENTS: This is a three unit class, instruction taking place one hour per day, 3 days per week for 18 weeks. The student will be required to write a case brief describing an actual court case and ruling on the admissibility of evidence.

RATIONALE: One of the major functions of a police officer is to bring the criminal to justice. All too often the criminal is released because the officer failed to present his evidence properly in court. Local law enforcement agencies have neither the time nor the staff to conduct the kind of in-depth training necessary in this complex field, but they are very much aware of the necessity for this training. The well-trained police officer can better fulfill his responsibility to the community by protecting them from repeated crimes by the same individuals.

OUTCOME: Each student should understand the laws and procedures for obtaining and presenting in court legally admissible evidence.

TASK: **Self Protection And Prisoner Control Methods**

CRITERION: The training will be judged successful when each student can demonstrate his proficiency in overcoming problems involving resistance to arrest. The criteria for testing will be:

1. The student's ability to withstand attack by a subject armed with a knife and disarm him.
2. The ability to disarm a suspect armed with a gun.
3. Use of at least 5 different "come-along" holds.
4. Use of the police baton as a defensive weapon.
5. Ability to subdue and handcuff an unarmed but violent subject.

REQUIREMENTS: This is a one unit class, meeting for 2 hours one day per week. The students will be given lecture instruction and demonstration, and will be paired off to practice and drill in the tactics observed.

RATIONALE: Nine times out of ten, an arrested subject will submit peacefully. It is the tenth subject who presents real problems for the arresting officer. It is not enough that a police officer be able to defend himself; he must be able to do so with the dignity befitting the uniform, and without brutality. He must also be able, not only to overcome resistance, but to restrain the subject and take him into custody.

In order to prevent charges of "police brutality" in every arrest requiring force, the officer must be trained in those techniques which have proven to be effective with the application of a minimum amount of force and physical damage to the suspect.

OUTCOME: The student should understand and be able to apply the techniques of self protection and control of prisoners and the mentally ill.

TASK: **Understanding The California Court System**

CRITERION: The training will be judged successful when each student can pass a written test with a score of 75% or higher. The criteria for testing will be:

1. To what extent can the student name and describe the functions and jurisdictions of the different courts?
2. To what degree is the student able to explain and interpret the principles of constitutional, federal, and state law as they apply to, and affect, law enforcement:
3. To what extent can the student apply the principles of law to actual situations.

REQUIREMENTS: This is a three unit class, instruction taking place in T-500 one hour per day, 3 days per week for 18 weeks. The student will be required to furnish text, notebook, and pencil. He will also be required to participate actively in at least one mock courtroom presentation, applying and utilizing the theories and principles of law given in lecture.

RATIONALE: All of a police officer's work in investigating a crime, tracking down and apprehending a criminal is wasted if the officer cannot get a conviction in court. In order for him to effectively present his case in court, he must be aware of the legal makeup of the court, court processes and jurisdictions, and understand the basic policies and principles applicable to the judicial system. If the officer displays an understanding of law and court procedure, his testimony is more effective, and consequently he is more often able to convict the violator he has apprehended.

OUTCOME: The student should have an adequate understanding of the laws and precedures governing courts, and of the court systems in California.

TASK: **Preparation Of Police Reports**

CRITERION: The training will be judged successful when the student is able to write at least five narrative-style reports which are judged acceptable by the instructor. The criteria for judging acceptability are:

1. To what degree does the report follow the rules of good grammar and spelling?
2. To what degree does the report explain the actions of the participants and the corpus delecti of the crime involved?
3. To what extent does it conform to the requirements for documentation of physical evidence?

REQUIREMENTS: This is a three unit class, instruction taking place 1 hour per day, 3 days per week for 28 weeks. The student will be required to furnish writing instruments. Report forms will be supplied by the instructor. The student will observe crime simulations staged in the classroom, and then write narrative reports on the scene. He will be given approximately 30 minutes in which to write these reports.

RATIONALE: As police work increases in complexity, the load of paper work required of the officer increases proportionately. An officer is required to write reports on almost any action he takes during his tour of duty. Most of the time, when the officer goes to court on an arrest he has made, the only method he can use to refresh his memory of the incident is the report he wrote at the time. If his report is not accurate, complete, and clear, his chances of getting a conviction are greatly reduced. It is necessary therefore for officers to be able to write clear, complete, concise reports, and to do so within the limited time allowed due to their work load.

OUTCOME: The student should be able to write acceptable narrative-style police reports.

TASK: **Preservation And Classification Of Fingerprints**

CRITERION: The training will be judged successful when each student can correctly classify three fingerprint cards using the Henry system and lift acceptable latent prints. The criteria for acceptability are:

1. Fingerprint cards will be read and classified to within a ridge count error of two or less.
2. Latent prints will have at least six points of comparison.

REQUIREMENTS: This is a three unit class, instruction taking place in T-500 one hour per day, 3 days a week. The student will furnish notebook and pencil, all fingerprinting equipment will be supplied by the instructor.

The student will locate and lift latent prints, mount them on cards, and identify points of comparison. He will also be required to roll prints for FBI cards and classify them correctly in the time allowed by the class period.

RATIONALE: Whether an officer works as a specialist in the Identification Bureau of a large department, or does his own investigation as a patrol officer on a small department, he must be familiar with the evidentiary value of fingerprints as a means of identification. The officer who knows where to find and how to lift comparable latent prints can bring cases to conclusion much more quickly and simply than one who depends on legwork and hunches. Fingerprints may be of vital importance to a police officer, and knowledge of their utilization is essential.

OUTCOME: The student should be able to locate, lift, and preserve latent prints, and to classify fingerprint patterns.

TASK: **Understand The Uses Of Firearms In Police Work**

CRITERION: The training will be successful when each student can pass a written test on the moral and legal aspects of the use of firearms with a score of 90% or above, and fire a qualifying score of at least 70 on a police pistol course. The criteria for acceptability are:

1. To what extent is the student familiar with the California laws relative to the use of deadly force by peace officers?
2. To what degree does the student display an awareness of the safety procedures employed in the use of firearms?
3. To what degree does the student show proficiency in the firing of the pistol and shotgun?

REQUIREMENTS: This is a three unit course, meeting at the police pistol course 3 hours per day, 1 day per week. The student will be required to buy .38 ammunition, the weapons will be supplied by the instructor. The student will also be required to fire the police pistol course under a time limit of two minutes, and achieve a score of at least 70. He will also take and pass written tests as required.

RATIONALE: The necessity for a police officer to be familiar with, and proficient in the use of firearms is obvious and cannot be overemphasized. The law has placed in the hands of a police officer the use of power with intelligence and compassion. In the event it becomes necessary for an officer to exercise deadly force, he must be prepared to do so, both mentally and physically. He must also be constantly aware of innocent bystanders, and be proficient enough in the use of his weapon to ensure their safety while fulfilling his obligation to the law and the community.

OUTCOME: The student should understand the mechanical, moral, and legal aspects of the use of firearms in law enforcement.

TASK: **Use Of The Polygraph**

CRITERION: The training will be judged successful when each student can, through the use of the polygraph, correctly identify the guilty party from a group of three suspects, and present an acceptable polygraph test as support for his conclusion. The criteria for acceptability are:

1. To what degree does the student display the ability to prepare the machine and subject for testing?
2. To what degree does the test he administers conform to the requirements of polygraph testing?
3. To what degree does the chart itself show indices of guilt?
4. To what degree is the student able to identify these indices as guilty reactions?

REQUIREMENTS: This is a 3 unit class, meeting three hours per day, one day per week for 18 weeks. The student will be required to furnish notebook and pencil. He will be required to prepare and administer polygraph tests to at least three suspects per class within the time allowed, and present to the class his conclusions based on interpretations of the polygraph charts.

RATIONALE: The polygraph is one of the most useful of the modern scientific investigative aids available to law enforcement. There have been recent cases where polygraph evidence has been admitted into court. It is an extremely useful tool, at least in the elimination of those people not involved in a crime. The officer who can effectively utilize this as an investigative tool will be a valuable asset to any police agency.

OUTCOME: The student should be able to use the polygraph as an investigative aid, and to interpret polygraph charts.

TASK: **To Understand The United States Criminal Justice System**

CRITERION: The training will be judged successful when each student can pass a written examination with a score of 70% or above on each of six examinations to include mid-term and final, and hand in an individual research on one issue or problem currently being encountered by law enforcement officers. The criteria for testing will be:

1. To identify the main criminal justice and law enforcement agencies at local state and federal levels.
2. To explain the function and purpose of the main law enforcement agencies at local, state and federal levels.
3. To understand the problems of law enforcement and criminal justice agencies as they relate to Supreme Court decisions based on the Constitution.
4. To understand and define basic law enforcement terminology.

REQUIREMENTS: The student will be required to furnish a copy of the Presidents' Crime Commission Report on Crime in America, plus his own notebook and pencil. The student will conduct an individual research assignment dealing with a current problem or procedure in criminal justice to be handed in at a time designated by the instructor.

RATIONALE: In order to have an understanding and basis for the procedures and limitations of law enforcement in our modern American society, a well-educated police officer must be able to understand the evolutionary process which preceded the concepts of today.

In the past decade, a strong emphasis has been placed on education and training at the community college level for all persons entering the field of law enforcement. The responsibility of properly preparing a young man for a career in this field has been directed towards the total institution rather than the individual agency. Since the information necessary for a well-rounded education must have a foundation on which to build, it is necessary that fundamental information be provided to the individual through a general course designed to offer both information and direction to the prospective and existing law enforcement personnel. As police agencies have neither the time nor the facilities for the necessary training involved, this responsibility has been placed on the community junior college.

OUTCOME: The student will have an adequate understanding of the administration and organization of criminal justice systems in the United States, which will enable him to better understand his basic responsibilities as a law enforcement officer in California.

TASK: **Understanding Office Administration**

CRITERION: The training will be judged successful when each student can assume the administrative responsibilities of correspondence, both oral and written. The criteria for testing will be:

1. To record and issue parking stickers for all persons enrolled at the college.
2. To process traffic citations issued by members of the Field Division of campus patrol.
3. To prepare written communications with outside law enforcement agencies on a follow-up investigation basis.
4. Student should be able to operate as a dispatcher utilizing a basic citizen band transceiver for directing field personnel in a safe and efficient manner.

REQUIREMENTS: The student must work independently as a member of a total unit under the supervision of a student commander. In addition, the student will be required to demonstrate through a written examination and weekly evaluations, those basic knowledges acquired through experience.

RATIONALE: In order to have an adequate understanding of the operational procedures involved, and to become familiar with the syntality of the small departments, a well-trained police science student must be offered an opportunity to experience and encounter the tribulations of inter-departmental operations.

Many students of law enforcement today are finding opportunities of employment with the smaller police agencies numbering 50 officers or less throughout the state of California. A well-trained police officer must be able to enter a department and with minimum retraining and assume functional responsibility with maximum of efficiency.

OUTCOME: The student should have an adequate understanding of office procedures associated with the operations of a small police agency which will enable him to perform those tasks necessary to assure a smooth operational bodies.

TASK: **Practice In Field Procedures**

CRITERION: The training will be judged successful when each student can assume the individual responsibilities comensurate with the established procedures as outlined in the student's manual for campus patrol. Each student will be required to pass a written examination with a score of 70% or above on information contained in the manual and on information disseminated through lectures. The criteria for testing will be:

1. The ability to identify and locate all division deans and college administrators by name and office.
2. The ability to explain the functions and purpose of a campus patrol in a community college.
3. The ability to understand the problems of law enforcement in dealing with situations which arise on a college campus of a non violent nature.
4. Student should be able to make a preliminary investigation and prepare a written report utilizing the chronological descriptive method on forms provided by the college or local law enforcement agency.
5. Student must be graded at 70% efficiency by student commanders under whose supervision he performs his various task.

REQUIREMENTS: This is a 2 unit class, instruction taking place in building T500-1 hour per week for 18 weeks with the student working independently as a member of a unit under the supervision of the student commander for an additional 6 hours in the field each week. The student will be required to demonstrate through a written examination and weekly evaluations, those basic knowledges acquired through experience.

RATIONALE: In order to have a complete understanding of the operational procedures involved and to become familiar with the syntality of the small departments, a well-trained police science student must be offered an opportunity to experience the tribulations of inter-departmental operations. Many students of law enforcement of today are finding opportunities of employment with the smaller police agencies number 50 officers or less throughout the state of California. A well-trained police officer must be able to enter a department and with minimum retraining, assume functional responsibility with a maximum of efficiency.

OUTCOME: The student should have an adequate understanding of field procedures comensurate with the operations of a small agency which will enable him to perform those tasks necessary to assure the maintenance of effective parking control and student discipline on the campus of a community college. The student will be able to communicate in an effective manner through both oral and in writing with college administrators and local law enforcement representatives on matters pertaining to the operation and safety of the college campus.

TASK: **Observation Of Police At Work**

CRITERION: The training will be judged successful when each student submits to the instructor two complete diaries on their daily observations of in-service personnel functioning in their normal capacities. The students will be assigned to two separate agencies during the semester. The criteria for testing will be:

1. The ability to explain the duties of specific personnel in two separate agencies in criminal justice.
2. The student will be totally familiar with the report forms used by two separate agencies for recording specific information.
3. The student will establish a working relationship with two separate agencies, and will demonstrate his ability to understand and follow directions.

REQUIREMENTS: This is a 2 unit class with instruction taking place in T500, and at specific criminal justice agencies as they may be assigned, 4 hours per week for 18 weeks. No text is required for this class but the student must provide his own notebook and pencil. In addition, the student will write a daily diary of his observations of the specific agency to which he is assigned.

RATIONALE: In order to provide a better understanding of the activities and duties of law enforcement and corrections personnel, it is necessary for the future law officer to have an opportunity to observe on a first-hand basis these agencies in operation.

Through the establishment of personal contacts created by the law enforcement student during his formative years, sources of information and assistants can be developed which will prove invaluable to the young officer during his early years of law enforcement service.

Since departments in California have a minimum amount of lower echelon liaison between their personnel, it is essential that some form of personal contact transpires in order to assure a more cooperative syntality between all agencies in a community. The community college has been placed in a position to provide such an experience to cooperative training.

OUTCOME: The student should have a better understanding of practical police work through opportunities to observe actual law enforcement and correctional organizations during normal operations by specifically working with and observing individual members of the organization during their normal daily routine.

TASK: **Administering Emergency First Aid**

CRITERION: Training will be judged successful when a student is capable of passing with 70% accuracy an examination designed to test both his mental and manipulating abilities under simulated emergency conditions by correctly applying first aid to a simulated victim. The criteria for testing will be:

1. The ability to assess with an adequate degree of accuracy injuries suffered by a victim as a result of criminal or negligent acts.
2. Familiarity with methods of controlling bleeding as a result of injuries.
3. The student should be able to administer restraining devices in the forms of slings and splints.
4. The student should be able to administer artificial respiration.
5. Familiarity with and ability to recognize illnesses common to indigent persons
6. A student should be able to pass with 70% accuracy the standard American Red Cross First Aid examination.

REQUIREMENTS: This is a 2 unit class, with instruction in T500, 2 hours per week for 18 weeks. The student will be required to furnish a current edition of the American Red Cross First Aid Manual plus his own notebook and pencil.

RATIONALE: The basis of evaluating the effectiveness of any law enforcement agency is the manner in which an officer can respond to an emergency situation. Since most emergencies involve the physical injury or discomfort of a citizen, it is essential that the officer responding be capable of administering emergency aid. This aid could result in the saving of a human life.

OUTCOME: The student should have the basic knowledge and skills which will allow him to administer emergency first aid under those conditions which occur during the normal performance of duties as a law enforcement officer.

TASK: **Understanding Police Public Relations**

CRITERION: The training will be judged successful when each student can pass a written examination with a score of 70% or above on each of 8 examinations to include mid-term and final. The criteria for testing will be:

1. The student should be able to recognize and identify each of the ethnic minorities within the community.
2. The student should have a fundamental knowledge of the racial and cultural background of the minority elements in California.
3. The student should become familiar with the basic difficulties experienced by law enforcement officers in dealing with racial unrest.
4. The student should demonstrate his techniques through role playing to emphasize his abilities in matters of racial and civil unrest.

REQUIREMENTS: This is a 3 unit class, with instruction taking place in building 1500, 3 hours per week for 18 weeks. The student will be required to furnish his own notebook and pencil plus a textbook designated by the instructor. In addition, the student will conduct an individual research assignment dealing with a current problem in Community-Police Relations to be handed in to the instructor at a specified time.

RATIONALE: In order to serve efficiently as a representative of a law enforcement agency, it is absolutely essential that an officer have an understanding of the racial and technical composition of the community which he has chosen to serve.

As a result of recent Supreme Court decisions regarding civil rights, as guaranteed by the United States Constitution, it is a basic duty of all law enforcement officers to guarantee equality to all persons for whom they are called to serve. Without a basic knowledge of human relations and conduct, a police officer cannot serve efficiently.

OUTCOME: The student should have an adequate understanding of the problems which confront a law enforcement officer in his relations with members of the entire community in his day-to-day contacts as a representative of his department.

TASK: **Collection And Preservation Of Evidence**

CRITERION: The training will be judged successful when each student can pass a written examination with a score of 70% or above on each of eight unit examinations to include mid-term and final and perform with 90% capability those tasks of evidence collections and identification that may be presented during the course. The criteria for testing will be:

1. Student will be able to identify and recognize those items defined as physical evidence.
2. The student will be able to properly collect the evidence that is available.
3. The student will be able to properly preserve all physical evidence that he collects.
4. The student will be able to properly mark and identify all physical evidence that he collects.
5. The student will be able to maintain a proper chair of possession of physical evidence in order to utilize it in a court of law for purposes of conviction.

REQUIREMENTS: This is a part of a three unit class in Criminal Investigation with instruction taking place in building T500 for 3 hours per week for approximately 4 weeks of an 18 week period. The student will be required to furnish a copy of a physical evidence handbook plus his own notebook, pencil, and evidence containers or devices as might be specified by the instructor.

RATIONALE: In compliance with recent Supreme Court decisions, greater emphasis than ever before is being placed on physical evidence. The custodial chain, from the time of recovery to the time of court proceedings, is being even more minutely examined to determine the authenticity of materials submitted. As a result, evidence which in the past was unchallenged is now being challenged and sometimes rejected because the evidence has been improperly handled. Thus, it is extremely important that proper methods be used in collecting and preserving evidentiary materials.

OUTCOME: The student should have an adequate understanding of the ways in which evidence involved in criminal cases can be recognized, collected, and preserved in order to be of value in an investigation of a criminal matter which could result in the eventual prosecution of a criminal suspect.

TASK: **Lifting Latent Fingerprints**

CRITERION: The training will be judged successful when each student can pass a written examination with a score of 100% on the steps to follow in processing a latent print. The criteria for testing will be:

1. The student will be able to identify a latent fingerprint by pattern.
2. The student will be able to locate and identify these surfaces containing latent prints.
3. The student will be able to develop and lift or photograph a latent print.
4. The student will be able to preserve the latent print as a means of identifying a criminal suspect.
5. The student will be able to maintain a chain of continuity on print evidence.

REQUIREMENTS: This is part of a three unit class in criminal investigation, instruction taking place in T500, 3 hours per week for 1 week of an 18 week class. The student will be required to furnish an evidence handbook, notebook, and pencil.

RATIONALE: In accordance with recent Supreme Court decisions, greater emphasis than ever before is being placed on physical evidence. The custodial chain, from time of recovery to the time of court proceedings, is being even more minutely examined to determine the authenticity of materials submitted. As a result, evidence which in the past was unchallenged is now being challenged and sometimes rejected because the evidence has been improperly handled. Thus, it is extremely important that proper methods be used in collecting and preserving evidentiary materials.

OUTCOME: The student should be able to lift and preserve latent fingerprints as evidence in cases of a criminal nature.

TASK: **Crime Scene Sketching**

CRITERION: The training will be judged successful when each student can pass a written examination with a score of 70% or above on one examination covering this specific subject, and perform with 90% accuracy, the task of making four basic patterns of sketching. The criteria for testing will be:

1. To know the proper method of measuring items to be sketched in relation to fixed items.
2. The ability to develop a rough sketch to a finished sketch acceptable for court presentation.
3. To be able to sketch a crime scene using the four basic projections taught.
4. To pass a written examination relating to items to be noted on the crime scene sketch.

REQUIREMENTS: This is a part of a 3 unit class on Criminal Investigation with instruction taking place in T500 for 3 hours per week for approximately two weeks of an eighteen week period. The student will be required to furnish a copy of a physical evidence handbook, a sketching pad, ruler, plus his own notebook and pencil.

RATIONALE: In accordance with recent Supreme Court decisions, greater emphasis than ever before is being placed on physical evidence. The ability to show relationship of items collected is a primary responsibility of the criminal investigator.

Evidence which in the past was unchallenged in the courts, is now being challenged and sometimes rejected because the evidence is not properly located at the crime scene. Thus, it is extremely important that all evidence be identified in relation to location.

OUTCOME: The student should be able to make the preliminary sketch of a crime scene in order to place all physical evidence collected in its proper perspective for presentation in a criminal court.

TASK: **Police Communication Methods**

CRITERION: The training will be judged successful when the student is able to pass with 70% accuracy, an examination on the codes and equipment most commonly used in police communications. The criteria for testing will be:

1. The student will be able to operate a standard auto-transceiver.
2. The student will be able to communicate and receive transmissions in nine, ten, and eleven codes.
3. The student will know and recognize other police agencies by call letters.

REQUIREMENTS: This is a part of a 3 unit class in Patrol Procedures with instruction taking place in T500 for 3 hours per week, for approximately 2 weeks of an 18 week course. The student will be required to furnish his own notebook and pencil.

RATIONALE: Since calls for service in a police agency are most often of an emergency nature, it is imperative that the patrolman being dispatched be given all information available prior to his arrival at the scene of the emergency so he may be prepared to handle the situation in an effective manner.

The number of police units in the field at any one time dictates that this communication be as brief as possible in order to allow other units an opportunity to utilize the radio network.

The use of communications codes reduces the amount of time necessary for broadcasts.

OUTCOME: The student should be familiar with the methods of communications used by a police agency for dispersement and dispatchment of police field units in response to criminal or emergency calls for service.